Entropy and Reversibility

Again, as premise for the next section we will briefly preview what we will explore regarding entropy, for the sake of context, delving in deeper later. The dark energy of spacetime has a vector state at any point x,y,z,t that is a 3d direction of the action that we call time, which has the invariant value of c=1. We must say "value" of 1 because in the very strictest terms, the non-angular differential-based "motion" is not fundamental, and is ultimately the observation of changes in relative velocity over space, as the result of purely angular motions "overlapping" spatially. Measurable linear motion is therefore a derived wave property. We can undoubtedly say the states of the vectors of spacetime change, but actual linear motion is a composite behavior of the waves-states of those angular vector motions. We will discuss the unique nature of the true essence of velocity in depth later, but for practical purposes, it is not incorrect to use the instantaneous value of spacetime vectors as equal to invariant c, just incomplete.

Time, then, can be said to be the action of spacetime occurring at all points and subject to vector direction at any point, with that direction dictated by the heat equation, (which takes into account the directions of neighboring regions to determine direction). Relative time, (time as measured by observables) is based on the amount of angular distance traveled @c required for any observable mass or energy particle to complete its closed-loop circuit, (360, 720 etc), through the medium of dark energy. The speed of light is itself relativistic, being the distance traveled through an angular arc divvied by the average relative velocity over space, but this ratio is consistent throughout spacetime in any given state of evolution of entropy, so it is "invariant" for all reference frames.

So the universe as a whole dilates and contracts as a process of entropy. The more ambient temperature in that dark energy, the more "noise" along the path of that closed loop and the more periodic action, (reduced second gradient) in spacetime is accomplished by that mass, per circumference, (circuit). Locally, the ambient state of acceleration, (i.e. ambient relative velocity) due to particle acceleration, exposure to a field etc, will result in the familiar classical "relativistic" dilation/contraction. So again, "time slows down", when the mass encounters more ambient acceleration in the medium universally or locally, whether in the hot early universe, at high velocity, or near strong gravity, or as we will see as the simple result of being accelerated at all.

Prior to the great expansion, our observable region of universe was near the

absolute zero entropy, zero temperature, maximum expansion ambient state. The energy of spacetime had effectively 100% trajectory alignment of its velocity. In other words, near perfect synchronized circle patterns as the state of the Q of empty space, with only the longest of wavelengths present and mass consolidated in singularities. Relative time, being dictated by amount of ambient noise in the medium, approaches zero, in the approaching-zero entropy state, before the potential energy restarts the process in a big crunch. The heat equation dictates that expansion and contraction have a differential relationship with one another and therefore length expansion accelerates, increasing the definition of the effective radius of any given particle, until a reversal and contraction takes place resulting in what could easily be mistaken for a singularity.

The effective "size" of objects in the universe would be approaching infinite as cool ambient temperature and consolidated mass made the paradoxical seeming condition of the universe as infinite size and a singularity at the same time, with only a geometrical distinction in the differential. Similar to the cross of the quantum threshold resulting in implosion to a black hole, the kinetic energy between dense clusters of mass reached a critical point such that their attraction resulted in a greater energy than the coherent energy maintaining the mass in those clusters. Essentially the process of entropy reverses itself with a simple arithmetic of linear to angular, (relative velocity over space to angular velocity). Again, we will examine this process in a devoted section later.

The fact we are faced with is that in an effectively infinite spacetime, absolute measurement does not exist. We arrive at only the geometric absolutes of a perfect circle or a perfectly straight line as anchor points. The simple geometry of two opposing circular rotation directions comes with the inverse geometry of the oscillating-direction straight line that is the vector sum of them. These never fully achievable two extremes, the perfect circle and perfect straight line form the boundaries of the spectrum of relativity in the ambient conditions that modulate the fermion geometry and dictate "how far away" the particles effectively are from each other, (again, as measured by their complete effective reactive circumference).

This dichotomy between those geometric inverses, (line and circle) is outlined in the progressive increase in linearity (ambient wavelength increase) brought about by entropy. The opposite-handed circles of acceleration and the corresponding linear acceleration that results from their cancellation, (the two options in a 3d pressure system) is the basis for both the fermion/boson geometric relationship and the basis for the metric of expansion of the measure

of time and space, in the blending of the two, as an ambient state. The result is the repeating differential oscillation of the universe.

The Heat Equation and Laplace

Before we delve into the quantitative aspects, it is worthwhile doing a high level overview of how this concept of diffusion of velocity vectors will end up describing particles with spin, probability amplitude, time dilation and the other properties of quantum mechanics. The goal we are moving towards is a description of spacetime in the language of a vector function and its differential equation that describes the quantum and relativistic together seamlessly with the forces that arise from the superposition of those vector systems.

The interesting side-effect of a model that finds the commonality between quantum and relativistic behavior is that mathematics and reality seem to join together when those holes in the conceptual fabric are closed. At first glance, some of these conclusions might seem to take general mathematical relationships too literally. After all, math is a symbolic abstraction from reality, isn't it? On the contrary, the more basic mathematical relationships that occur in the fabric of spacetime simply re-emerge to be observed in the behavior of higher order macro systems, consequently in a context that makes those maths seem to be only abstract representations. Our relative subjective perspective of reality has been the standard that our systems of mathematics had to live up to, but in some ways, ultimately it must be our perspective that must live up to the fundamental nature of the math. At the fundamental level, the math is seamless and absolute.

Like building blocks, a simple fundamental dynamic based on 1D of force attempting to be diffused evenly in 3 dimensions can result in complex higher order dynamics because of the rich emergent geometric dynamics that can be scaled from those fundamentally-incongruent building blocks. Some of these basic mathematical phenomenon are the Lorentz relationship between time, action and length, the relationship between momentum and energy, the Fourier sinusoidal series, along with Euler's formula and infinite polynomial series among others. It will be shown that the nonlinear higher order relationships in physics result from geometry applied to a simple linear relationship.

The percentage of any given period of time, that a Q region of energy is "on its path" as opposed to a random trajectory (% of conformed per total path in

modulated circuit), we will take the liberty of referring to as the probability amplitude. In practice, the path a region of energy takes is always randomly oscillating, it is just a matter of how much the velocity vector is weighted toward a vector direction that corresponds to the structured fixed-period sinusoidal path through space, at any given time.

As another analogy we could imagine the random motion of air molecules causing outward pressure in all directions inside a balloon and then imagine a heavy ball bearing inside the balloon. If we swirl the balloon around, the ball bearing will trace a circular path that bulges the balloon outward in one spot that travels the path with a fixed period. Now imagine the ball bearing has a component of erratic motion, but still is statistically likely to have some vector component of motion pointed in the direction of our initial swirling.

The diffusion force acting with an ambient wavelength, (i.e. Q regions of spacetime) are all like these balloons, directly adjacent to one another and when one balloon has an oscillating pressure point, it causes an oscillating pressure point in all its adjacent neighbors, and that periodic action is communicated outward radially to all surrounding balloons. The periodic function that describes the motion would have a probability amplitude of conforming to the periodic rest-geometry. To reiterate the propagation phenominon, if there were just one ball bearing, in one balloon, in this group of balloons, (like the symmetry-center of a particle) all of the surrounding balloons would still still have a non-zero probability of oscillating with the same period as the balloon, because of the propagation of that acceleration. The lowest-energy-seeking group arrangement in the symmetry causes this non-random probability amplitude, (PA for short).

All directions of random velocity in the balloons would have their trajectories affected by the percentage that is the amplitude of the fixed-period structured bulge action. In the group of balloons, the farther radially away from the center balloon, the lower the probability amplitude of any trajectory conforming to the period of our oscillating cos function that describes the timing of the pressure bulge.

So probability amplitude, as it concerns observable particles is more than just the likelyhood of a “yes” or “no” detection by reaction. Just like observables are particles and waves simultaneously, probability amplitude consists of two parts, the probability part and the amplitude part. The nature of periodic geometries in a randomized dark energy means that the state of any point in spacetime is inherently randomized to some amount, but the closer you get to a structure

with an observable, fixed-period, the more likely you are to trigger a measurement of the particle associated with it. Trigger is the crucial word here. The PA is measure of finding an acceleration that has a fixed period component with sufficient magnitude to react with other periodic particles according to quantum steps, (satisfaction of complete geometries).

In general, all particles influence all parts of spacetime, to infinite radius, but the magnitude of that influence falls off with distance from it. The state from that particle gets blended with the states from so many other particles in spacetime and only interacts in those distinctive quantum ways, (emitting photons, etc) when at the right proximity for that triggering reaction.

It is a mistake therefore to say that PA is a statement about a particle existing or not existing, but rather being detectable via "circular-reacting thing" or not being detected. The existing or not existing, as we have discussed, is an artifact of our measurement tools. Probability amplitude is still a term we will use, but it will be used to describe the component of acceleration attributable to a particle geometry, (as opposed to random) at any given radius, applied to all intensities of the states of the Q attributable to a particle.

Again, PA consists of two parts, the amplitude and the probability. The random modulation of spacetime, (from the ambient effect of so many various sources and distances), will always result in the amplitude from a particle being inherently probabilistic, at any given location. The description and vector formula developed will describe these amplitudes between the quantum steps, according to the blend of differential elements from the underlying geometry of the vector structures themselves.

It is important to have an intuition for the periodic interaction between Q and how it relates to propagation of probability amplitude, so we will use one more, even sillier analogy. The overall probability of those periodic paths of diffusion in the Q, always point to the lowest energy trajectory, (fixed-period or not) and how the adjacent Q influence each other can be compared to the analogy of two pirates, one of which is drunk. One pirate is staggering around, oscillating off the correct path as he moves around the perimeter of the ship, on his watch. The official "ideal" path of his watch is like the fixed-period observable structure in the state of spacetime where a particle is. The "true" motion of that pirate is the hypotenuse that results from the ideal path and the randomization. The energy in a Q of spacetime is a blend of random and non-random circular periods, (the geometrical structure modulated by the random).

Only a certain percentage of the pirate's walking energy is spent in the direction of his loop and he has a certain probability amplitude of being on that path at any given time. The more drunk the pirate is, the lower his probability amplitude of his particle-ness. If there were a sober pirate, moving on watch next to him, they will influence each other. They will both influence each other. The drunk neighbor bumps into the sober neighbor causing him to stagger, so he will also stagger, but to some smaller degree. The sober neighbor is staggering less than the other, so he, "straightens up" the neighbor next to him and increases the likelyhood of the drunk neighbor being on the correct periodic path, as measured per unit of time. The center of a particle is more "correct" and becomes more randomized pirate-to-pirate (Q to Q) radially.

This dynamic is at play at any point in space that experiences a higher relative-velocity from the Q on its left than the Q on its right, (as a neighbor bumps into it). This acceleration will alter its course, necessitating a rotation as dV/dt to minimize this d^2V/dx^2 (in any component of velocity x, y or z). If that Q experiences this non-zero second order derivative with respect to x, in a specific periodic way, there will be a specific probability amplitude propagated from the original point, diluted at each Q as the radius increases, (owing to increased surface area exposure to randomized states).

In the case of matching the periodic pattern of a neighboring Q that is in the direction of a large mass, the field intensity of the mass diminishes as the inverse square of radius because the further from the source, the more Q neighbors have been included in that averaging which to greater and greater degree includes purely random accelerations of the vacuum. So not only does the diffusion-averaging of neighbors cause periodic pattern propagation, but when one Q is closer to a field source, a disproportionate second gradient of that diffusion force (delta d^2V/dx^2) points toward it. If we stop time and consider any vector of acceleration (on its periodic pattern) in a Q that is further from the source, the act of matching the vector of the stronger Q next to it means it will necessarily assume vectors that point more toward the gravitational field source overall. As we have said this is an incomplete statement. In truth, what is "pointing" is the gradient caused by the spinor structure. As we will see, the handed nature of the spinor is what causes the disproportionate superposition with another spinor structure (i.e. fermion), resulting in the Q-to-Q propagation of the whole fermion state, as again, the simple result of diffusion to minimum energy state.

As we touched on in a previous section, the most difficult action to conceptualize

is how that structure can then “move” in space, simply because the differential geometry pushes a greater probability amplitude of the geometry on one side than on the other. In very real terms, the core geometric path exists in more than one location. When accelerated into motion, the core geometry truly can be considered to officially exist at more than one location, propagating in a redundant way more on the side of the direction of travel, as it accelerates.

“Where the particle is going” is just another fractional, redundant version of the particle that slowly increases in PA, (as the third gradient between two spinor structures constantly tries to reach equilibrium while perpetually “tilted” by the other particle). “Where the particle has been” is another fractional redundant version of the particle that slowly diminishes in PA in the wake. The additional versions result in an increased overall energy associated with the particle, as it is blurred out over space, superposed with the other fermion.

Because the pattern always propagates radially from any location, the core loop structure of a moving particle is reinforcing itself in “more than one location". The observed rate of travel of a particle is directly due to the fact that one of those locations that its structure-pattern has radiated-to is more “true” to the core sinusoidal state than the others, (i.e. it has a growing % of the random that conforms to the periodic), attracting or repelling as a result of the superposition. This rate of growth of the core at a location in the path of travel is based on particle/particle phase interaction and proximity.

So the version of the self-reinforcing structure that has a stronger PA of the symmetry eventually wins the right to be called “the particle”. In this way, the energy describing the structure of the particle does not “move”, but that differential relationship pattern is propagated radially, with a disproportionate amplitude fore and aft, (toward/away from the stronger second gradient of force).

We will examine the specific structural difference between physical mass and its force and how a source of force causes greater probability amplitude in nearby matter particle. At a distance away from the mass it does not have the complete compound circular symmetry found at the center of mass, so what “force” does to spacetime could be considered “half-mass” in a way. This is evident in the distinction between spin ½ and spin 1 particles and comes with rotation directions dictating charge, color charge and many other phase interaction traits that we will examine later.

Spacetime Interval and Condensates

We will focus for a moment on relativity and its implications as it concerns this ambiguous idea of spacetime being an infinite condensate of momentum. At first glance it seems intuitive that if time and distance are relative, the amount of momentum and energy found at a particular place in spacetime would also be relative. This is true, but on closer inspection, the conceptualization proves to be more complicated than the intuition. Because, in truth, what does our intuition about physical space really mean, other than our concept of "how long does it take to travel it?", or "how much capacity to affect matter and energy does it have in there?".

When these action/outcome based observations are relative to the geometry of the state, at a certain state of geometry there is just no more "there" there, regardless of our intuition that circles have things inside them. So it is misleading to think of the distances in spacetime to be an absolute property and to wonder "what about all the stuff inside the smallest plank length".

The concept of the invariant speed c follows from this. We will find that the action of spacetime is one where the action of time constantly attempts to divide neutral space evenly, across an uneven number of dimensions, (i.e. V=x/t). A perfect-circle 2-D planar path of acceleration then, represents 100% efficient dividing action. In the 3-D context however, equilibrium can't be attained. Any subsequent modulations of that perfect circle should be considered dilation conditions.

When we again consider the heat equation, a change of a component of the velocity c with respect to time, (a rotation) results from a disproportionate distribution of that dividing action @c, (when the change in the component of velocity, (change of dividing action) is greater on the left than on the right of a point x,y,z in the function). It should be remembered, for clarity that the single derivative of velocity with respect to space dV/dx will always be nonzero in spacetime, since the1 dimensional action of time is constantly rotating to achieve equal distribution, (maximum diffusion). The second space derivative is where we observe sustained imbalances of this equilibrium, around periodic geometries.

Synonymous are the ideas of 1. forces acting between Q 2. the averaging to 3. dark energy as the action of time @c that divides space equally by altering trajectory. Regardless of how we nutshell the action, when one region dx of spacetime is being divided unequally compared to the region next to it, the vector of dividing action @c points toward the direction of that imbalance. In general this "imbalance" is taking place at all times and at all scales, it is only in the optimized periodic geometries that we see the distinction of localized sustained gradients and the observable that arise-from/cause them.

Again, the analogy of water finding the lowest gradient of topology to flow-to, fits the situation. Dark energy wants to be at the lowest state, and so its changes in direction to reflect this, to infinite resolution, the distinctive boundary of which is the geometry of 100% acceleration, (the perfect circle). Thus again, we get the Planck-length of the Q which comprises particle geometries, and that "minimum effective length" being subject to relativistic conditions in the diffusion-attaining compositions we observe.

The geometric method we will outline, extracts the area of the rest mass by observing the total circuit path (i.e. total periods and phase shifts) of the intrinsic vector geometry functions of spacetime @c, (modulated circles or not) and in doing so we eliminate the need for transforms from otherwise relative units of measure. In this way the length representing the acceleration due to rest mass is seen invariantly regardless of any apparent modulation of the rest mass giving it a loop structure encompassing a greater area under its curve and thus measuring time differently. We will discuss this effect on the measurement of mass and energy in detail in a later section.

c^2 and V^2

Let's step back to a more classical perspective and try to regroup. How does the invariant c, applied to periodic vector functions with these lop-sided differential symmetries result in the mass/force/energy dynamics we see classically? Let's revisit the question of why we see the distinction between a single velocity for momentum, but the velocity squared when we describe energy? The mathematical derivation only goes so far in satisfying true understanding.

We refer again to the fact that the fundamental action "time" is a one dimensional, (linear progression) action in an infinitely divisible 3 dimensional substance (dark

energy), governed by the propensity to angular motion to maintain lowest energy trajectory of that linear action.

Particle structures are built of complete loops of this action through spacetime, (being a maximal satisfaction of this space-dividing propensity to minimum energy). So it would might make sense at first glance to claim that the "amount" of this linear action @c, would just be c times the circumference of the circle it makes. But the 3D space divided by 1D time differential that governs the action makes the measure of energy E inherently "a measure of capacity for inter-action which takes a specific periodic form", within all of dark energy effectively containing the same "actions of potential", but in a random way.

The stripped-down view of the heat equation is: "change in linear action is happening as a result of one linear action opposed to the other both seeking least energy". The fact that this inherently demands to be described as the square of velocity and the optimal shape that results is a 2-dimensional area, (that must be calculated by a squared term is not coincidental. The "amount of interaction potential" taking place in a complete loop of spacetime, within a random "medium of action" therefore automatically implies an equal and perpendicular vector of background action of dark energy, (or action induced on other particles, which is essentially the same thing). So the squared term is needed in c^2 or V^2, to account for the energy interaction potential that a structure represents, which amounts to an area, as the amount of differentially distinct energy.

The calculation of an area requires a length times a width and as explanation for this, we can either say the calculation of amount of energy requires an area (and areas are just multiplied so don't ask questions) or we can say that an area as we know it in spacetime is actually an amount (scalar) of this interaction of two linear vectors of action that together form a relationship that must be described as the multiplication of each of their values, (as they both perform their differential actions). Again, we can view spacetime from either the foreground perspective or background and either the verb or the noun but ultimately it is only describable by the configurations that cause amounts of change, which must account for both.

So this "clash" between vectors of time @c trying to divide space equally is the origin of acceleration, (and so the squared term $nax=\sim nv^2$) and produces what we call force, (an amount of acceleration) that is encapsulated in particle geometries in an amount we call (E) energy. Where this is found in a 3d composite structure of 2D geometries, (allowing the heat equation minimization

to be symmetrical on that plane), the bounding dimensions of that geometry define a quantity of energy that is the square of that 1-D dividing action. So $(x/t/t)(x)=c^2=ax$. The (n) above or (m) for Mass is a scalar for that quantity of planar area, (ultimately effective intrinsic period, as we will see) of the dividing action of spacetime and so we have mc^2. Again, the effective circumference of that planar area changes when structures superpose and when wave interactions take place but c remains the ratio of relative linear to angular regardless. In the practical application of the vector math, the effective area of differential particle-ness will be quantifiable by total angular period of a particular observable variety, (including phase-shifting associated with accelerations).

This c^2 clash takes place at all effective scales randomly, canceling in the vacuum but resulting in a net gradient of the heat equation in stable periodics. The randomized arrangements of the dividing action that take place in the vacuum, result in various wavelengths of rotation, of random phases converging at any given point in space, making a net higher acceleration in the vacuum, than in the vicinity of fixed-period structures.

"i"

Before we begin diagramming the intrinsic geometries, we will mention a very irrational-seeming mathematical concept that received much apprehension when it was proposed, as do most new concepts. It bears significance to this subject because it describes things that exist within the realm of "does not exist", or better put, it exists as a placeholder for a quantity of something immeasurable that exists as a part of something measurable, under the current definition. The "ghost half" of quantum periodics.

The imaginary number "i" represents the square root of negative 1. It was invented to fix a kind of glitch in our method of using the negative sign. The negative sign had historically been used to indicate a deficit of something positive. Multiplying a negative number by a positive number therefore meant to multiply a deficit by some positive scalar to increase the deficit. Multiplying a deficit by a negative number would seem to indicate a multiple of decrease in the deficit. But a negative times a negative is a positive. Even though a positive times a positive represents a positive area in geometry, a negative times a negative equals a positive area, not a negative area. We had a choice between using negatives to mean a deficit (i.e. reduction in amount) of a thing, (like a $5 discount) or an opposite property of thing, (like a negative charge). We had to choose if the negative sign would be the action of deficit or a quantity of a deficit.

We chose the action of a deficit, (a deficit of a deficit is a gain). So deficit quantities, (opposite substances) needed another way to distinguish themselves.

When needed to preserve the negative trait of a substance in division and multiplication, among other things, and so the value "i" was born. The imaginary number "i" packages the square root of −1 in such a way as to hold it exempt from the loss of the minus sign. It then allows for the concept of negative area of a "negative thing". We will find that when observables are described by geometries that include some unobservable parts, the irrational i marks the "un"stuff. Like describing a bicycle wheel with the math for a disc, the imaginary number might account for the space between the spokes.

This concept of a negative area is prominently employed in the modeling of the spinor because half of the structure of its rest mass exists in the realm of "does not exist", at any given time. The packaged concept of negative area is used to describe the ghostlike condition of the potential of a particle at those intermittent points in the structure where the "un-existing" is taking place.

So the i value represents a negative observable-area in spacetime. The areas of spacetime energy which are used to signify potential, (and therefore observable existence) are particular arrangements of force which are maintained by the geometry of the particle, for this reason, the places within the wavefunction where there is no observable maintained positive area of spacetime will necessarily be "negative areas".

The fact that i packages a −1 behind a square root means that it can represent negative area and also when coupled with an exponential variable function, it can represent oscillation between negative vs positive area at a point, (dark vs observable energy), when the period of the structure increases and rotates due to the acceleration forces, as we will examine. The exponential function, the loss of the need for complex numbers, Euler's identity and Fourier are also related and will also be discussed in detail later.

End of Section 5