Infinitudinal Complexification

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To the undoubted displeasure of very many detractors, this research program has heretofore focused on aspects of physics so fundamental that many of said detractors do not even acknowledge the program as physics. This paper responds to detractors' criticisms by continuing the program in the same direction and style as earlier work. We present one new quantitative result regarding the big bang and we find a particularly nice topic from fluid dynamics for qualitative treatment. A few other topics are discussed and we present quantitative results regarding the fine structure constant and the differential operator form of $\hat{M}^3$. This paper is somewhat reiterative as it calls attention to directions for further inquiry and continues to leave the hashing out of certain details to either a later effort or the eventual publication of results by those who have already hashed it out, possibly several years ago by now.

"Consider a scattering experiment in which two particles collide and turn into three particles. Ignoring internal and spin quantum numbers, the initial and final states could be described by wavefunctions $\psi(\mathbf{x_1}, \mathbf{x_2})$ and $\psi(\mathbf{x_1}, \mathbf{x_2}, \mathbf{x_3})$. However, it is by no means obvious what type of time-dependent Schrödinger equation could allow a function of two variables to evolve smoothly into a function of three variables."

$\sim$ Chris J. Isham

PRELIMINARY

The main bottleneck in big bang cosmology is that it is difficult to define an evolution operator that can evolve the non-existent state of the universe, equation (1), into the current many-particle state that satisfies equation (2).

$$|\psi\rangle = 0 \tag{1}$$
$$\langle\psi|\psi\rangle = 1 \tag{2}$$

Equation (3) shows how the quantum mechanical volume operator $\hat{V}$ can be used to return the Hubble parameter H (or a generalized scale factor a) at some proper time t.

$$\langle\psi|\hat{V}(t)|\psi\rangle := H(t) \tag{3}$$

The time dependence in quantum mechanics can be equally well represented in the operators as in equation (3) (Heisenberg picture) or the wavefunctions (Schrödinger picture) so it is natural to include two time components like chronos and chiros.

Notice the following.

$$\begin{aligned} |\psi\rangle &= 0 \\ &= 1 + (-1) \\ &= \hat{1} - \frac{1}{4\pi}\hat{\pi} - \frac{\varphi}{4}\hat{\Phi} - \frac{1}{8}\hat{2} + \frac{i}{4}\hat{i} \end{aligned} \tag{4}$$

Equation (4) defines a dual vector.

$$\langle\psi| = \begin{pmatrix} 1 \\ -1/4\pi \\ -\varphi/4 \\ -1/8 \\ -i/4 \end{pmatrix}^T \tag{5}$$

Regarding the coefficient 1/8 for the $\hat{2}$ term in equation (4), there is a more obvious connection than that which was given in reference [1]. The factor 1/8 seems like it may contract with the well known factor $8\pi T_{\mu\nu}$ in Einstein's equation leaving the term π available for interpretation of $T_{\mu\nu}$ as a description of what happens at $\hat{\pi}$-sites. We previously obtained the factor 1/8 by operating with the determinant [1] which is commonly understood as a type of volume operator so there is reason to expect a deeper connection between the quantum mechanical volume operator in equation (3) and the volume of some manifold holding the dynamics of general relativity. However, given that 8π appears as the coefficient for $T_{\mu\nu} := f^3|\psi;\hat{\pi}\rangle$ [2, 3] which already has $\hat{\pi}$-locatedness implied in the ket, this may be nothing more than a mirage. After all, 8 is not part of the ontological basis. Perhaps the factor of π remains unhatted and in waiting for projection back to the quantum picture after the other hatted π in $|\psi;\hat{\pi}\rangle$ is used in a distinct projection from the quantum picture into the relativistic. This is only one of very many issues, such as the connection between f^3 and the energy density of the vacuum, or the classical formulation of the advanced potential that gives the operator ∂_t^3, that remain to be treated with rigor, hopefully by the graduate student(s) of one who has a grant with which to commission such work.

To make rigorous the connection between equations (1) and (2), let us make a change in notation. The 5D wavefunction of the objective universe shall be Ψ and the 4D wavefunction of the observer's subjective experiences shall be ψ. We can get the behavior of equation (7) out of equation (6) by using any of infinitely many 4D subspaces of Ψ.

$$|\Psi\rangle = 0 \tag{6}$$

$$\langle\psi|\psi\rangle = 1 \tag{7}$$

Note the pattern of the signs $\{+ - - - \pm\}$ in $\langle\Psi|$ and $|\Psi\rangle$ and how it is also the metric signature of the de Sitter spaces $\Sigma^\pm$ [4, 5]. The metric tensors $g^\pm_{AB}$ for $\Sigma^\pm$ go as follows when A_μ and A_ν are an electromagnetic potential vector and a dual vector.

$$g_{AB} = \begin{pmatrix} g_{\mu\nu} & A_\mu \\ A_\nu & g_{44} \end{pmatrix} \tag{8}$$

We have previously shown three different ways [2, 3, 6] to use the golden ratio to derive Einstein's equation where the successive levels of $\aleph$ [7] on $\{\aleph, \mathcal{H}, \Omega\}$ are enumerated by different sequences of Φ that always satisfy $\Phi^{n+1} = \Phi^n + \Phi^{n-1}$. Here we will work in the gauge where $n = 1$ in the present so it is defined on Φ, the past is defined on 1 and the future is defined on Φ^2. The interpretation for the present on Φ will be that we take normal, symmetric, Fourier-decomposable physics defined within a periodic domain of 2π and make use of the operation $\hat{2}\pi = \pi + \pi$. With two copies of π we can then send one to Φ with $\hat{\pi} = \varphi\pi\hat{\Phi}$ leaving two different but equal entities: some chronological math on $\hat{\pi}$ and some chirological math on $\hat{\Phi}$. When the observer acts to make a measurement he selects a point that is currently in the future and then it becomes his present [6]. Regardless of the "actual location" of the point, his selection imposes a gauge condition such that the "chirological interval" between his moment and the moment of the observation is Φ as measured along the ξ^4 direction [4].

Now we specify the metrics in each of the hyperspaces $\{\aleph, \mathcal{H}, \Omega\}$ which are more or less slices of the hyperspacetime $\Sigma^+ \cup \Sigma^-$.

$$g_{AB}\Big|_\aleph = \begin{pmatrix} g^\aleph_{\mu\nu} & A^\aleph_\mu \\ A^\aleph_\nu & -\varphi \end{pmatrix} \tag{9}$$

$$g_{AB}\Big|_\mathcal{H} = \begin{pmatrix} g_{\mu\nu} & A_\mu \\ A_\nu & 0 \end{pmatrix} \tag{10}$$

$$g_{AB}\Big|_\Omega = \begin{pmatrix} g^\Omega_{\mu\nu} & A^\Omega_\mu \\ A^\Omega_\nu & 1 \end{pmatrix} \tag{11}$$

The chirological phase convention defined above shall relate to the curvature parameter in the de Sitter spaces by adding or subtracting Φ so $g_{44} \in \{-\varphi, 0, 1\} \leftrightarrow \Phi^n \in \{1, \Phi, \Phi^2\}$.

The linearity of quantum mechanics can be connected to higher order differential equations through the magical identity $\Phi^2 = \Phi + 1$. All possible states of Ψ and ψ must be expressible as linear combinations of $\hat{\Phi}$ and $\hat{1}$ taken together with $\hat{2}$, $\hat{\pi}$, and $\hat{i}$, and this also has a direct application to what must be true about $\hat{M}^3$. In the process $\mathcal{H}_i \mapsto \Omega_i \mapsto \aleph_{i+1} \mapsto \mathcal{H}_{i+1}$ we start in the chirological phase denominated with Φ^1 and then move up one level to Φ^2 in the future Ω. It is clear that the future term Φ^2 can be decomposed into a 1 term and Φ term as is required for a periodic behavior in the system: the phase associated with Ω_i is decomposed to give those associated with $\aleph_{i+1}$ and $\mathcal{H}_{i+1}$ so that the process can repeat forever with Φ^2 arising periodically on Ω_{i+1}, Ω_{i+2}, etc.

If we take the chirological phase as the fundamental entity and determine the g_{44} in equations (9-11) by subtracting Φ it makes sense that $g_{44}|_\aleph$ is negative. However, if we start with a tier of curvature parameters that satisfy $\Phi^{n+1} = \Phi^n + \Phi^{n-1}$ we will never get a negative value and we will never get the 0 needed to have a flat universe in the present. It appears that the phase must determine the curvature and not vice versa but we will have more to say about this below, and also a few words regarding the additive factor of Φ when all other instances of Φ have been multiplicative.

TWO NUMBER LINES

The original idea for a second number line such as that which appears in this research – chiros as opposed to the original number line: chronos – came about in a study of the period doubling cascades that arise in chaotic dynamics. For example, consider convective rolls in a finite, bounded volume of fluid heated from below as in figure 1. When the temperature gradient in the cell reaches a first critical value the rolls will become unstable as new waves begin to move along the rolls' axial direction with some frequency f_0. As the heat increases, more waves will appear with frequency $f_0/2$, and then as heating increases more it will be possible to observe waves with frequency multiples of $f_0/4$, then $f_0/8$, etc., until period doubling exceeds the resolution of the experimental apparatus and eventually the onset of turbulence is complete. See reference [8].

Consider the case when the heat is only slightly above the critical value needed to induce instability and there

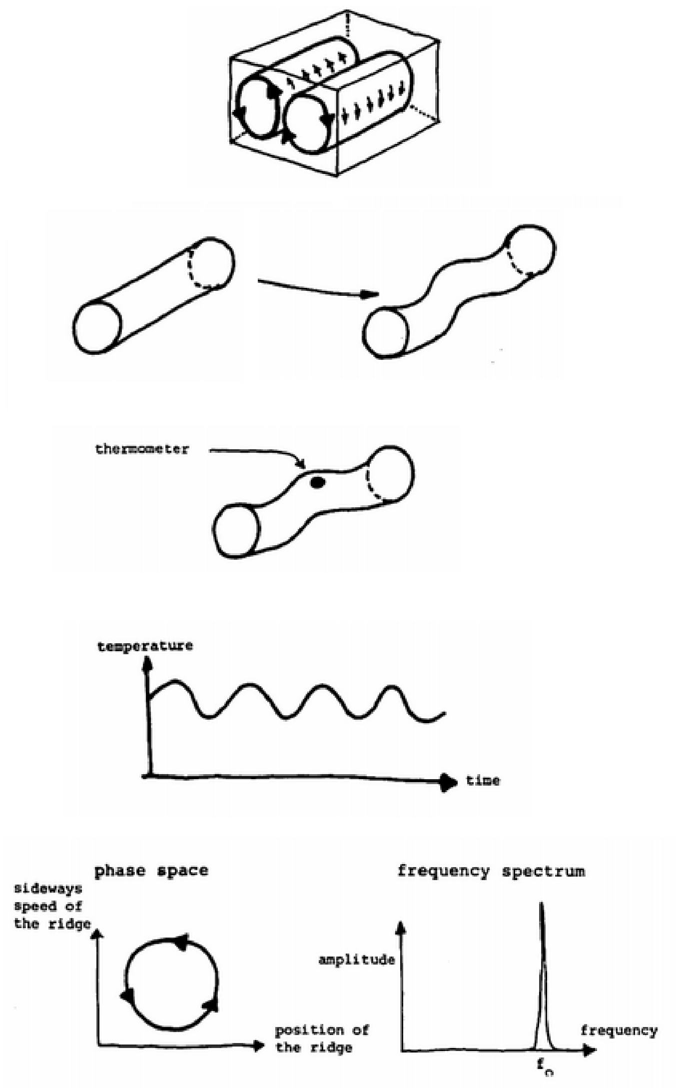

FIG. 1. Two convective rolls form in a finite volume of fluid when it is heated from below. When the heat gradient is very small, the rolling is laminar but when the gradient is increased beyond some critical value the rolls become unstable. When a thermometer is inserted into the cell, it will show that the temperature at the location of the probe oscillates with some frequency f_0. Figures excerpted from reference [8].

are two wave modes observed on the convective rolls. The modes have frequencies f_0 and $f_0/2$ as shown in the second row of figure 2. Furthermore, consider the theoretical description of the system as a differential equation controlled by a dissipation parameter k and not the physical system itself. The differential equation describes relationships between different derivatives of position with respect to a single number line: chronos. Although it is irrelevant, for visual purposes we present the example given in reference [8].

$$\ddot{x} + k\dot{x} - x + 4x^3 = A\cos(\omega t) \tag{12}$$

We want to consider the critical value of k that led to the period doubling of the first order instability upon appearance of the second order mode (figure 2). As we increase k in small increments we will see the $f_0/2$ mode decrease in amplitude until the final increment Δk moves past the critical value and the period of the oscillation is halved so that the phase space trajectory returns to the limit cycle at the bottom of figure 1. The $f_0/2$ peak is no longer there and the solutions to the differential equation will have a period only half as much as it was when the $f_0/2$ mode was arbitrarily small. For describing an actual physical system with a limited resolution this is fine. For understanding the dynamics of the transitions into and out of chaos there is something lacking. It is impossible to examine the dynamics arbitrarily close to the value of k where the second order instability occurs because the existence of the critical value can only be inferred by examining the solutions when k is above or below it.

What is k's numerical value at the critical point? We have no way to know.

Instead of stepping the friction by small increments Δk, consider the case when k is varied smoothly. Starting again at a value of k when there are two frequency peaks f_0 and $f_0/2$, we begin to increase k in parallel with an adequately proportional smooth rescaling of the plot around $f_0/2$ so that the amplitude of the peak appears unchanged in relation to the viewing window. As k decreases smoothly, the peak appears the same and only the vertical scale changes. This can go on forever and the peak will not disappear though it may become necessary to rescale the plot infinitely faster than the rate of change of k. This could never be accomplished on a finite computer but in principle it illustrates the effect we are calling attention to. In the purely analytical world of pen and paper it is trivial to scale the window infinitely faster than the variation of k by using hyperreal numbers to describe the rate of change of each.

How can we have a differential equation description of the system? Differential equations describe smooth changes but peaks can never disappear or appear out of nothing in a smooth variation such as that described above. Either the peak was always there and just very small or it was never there with amplitude zero and must retain that amplitude forever. We can analyze the period doubling in the experiment with the equation that describes it but how can we can analyze the behavior of the descriptive equation around the critical point when there is no smooth transition from period T_0 to period $2T_0$?

One way to resolve this problem is to define an initial condition, for example, of a single instability with period T_0 on two number lines. All the oscillating modes are

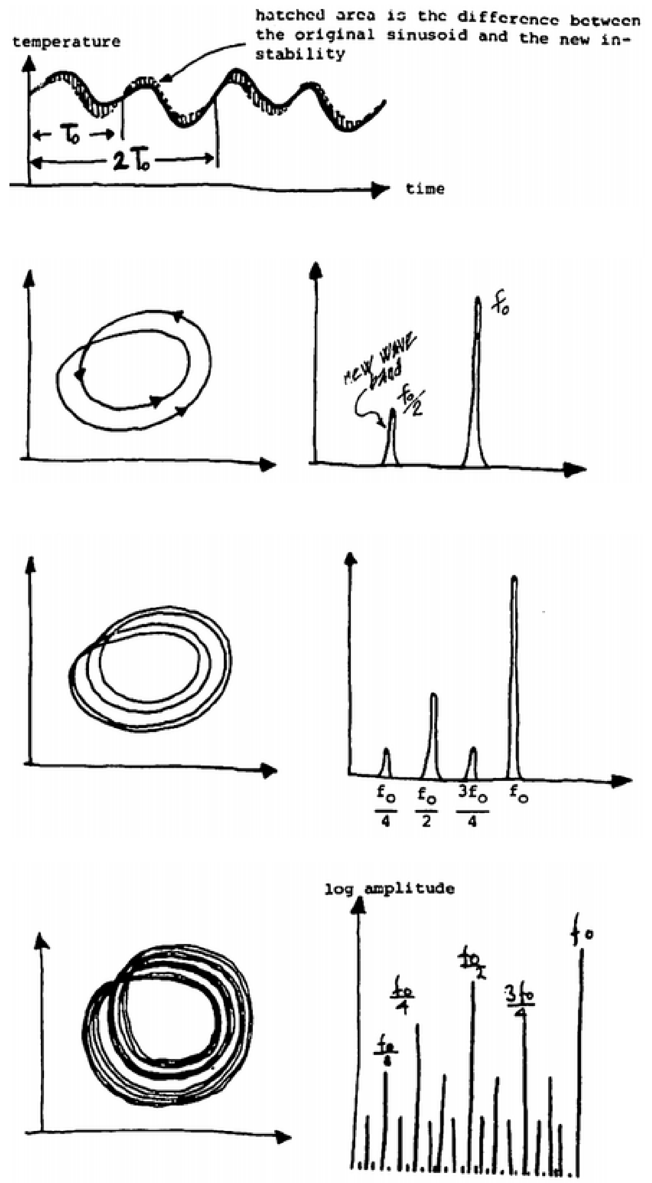

FIG. 2. More figures from reference [8] describe the onset of turbulence through the period doubling cascade. The period of the oscillations doubles with the appearance of an $f_0/2$. It doubles again to $4T_0$ and again to $8T_0$ as the system becomes increasingly unstable.

already present but f_0 is on the number line that describes the experiment and the other modes are on the other one. This is more or less the same idea we used to describe the state/qubit system in reference [7]. Let the number lines intersect at the period doubling values of k in a way such that the appropriate modes transfer from one number line to the other at each intersection.

This is in perfect keeping with what we have previously required of chronos and chiros. We have wanted to evolve solutions beyond timelike infinity at the end of the universe by using the solution at infinity to reconstruct the entire universe along with an analytically continued trajectory from minus infinity which can then be used to determine that which is expected to happen at the time that follows the moment in which the observer decided to make the calculation. Just as the critical values of k can never be reached, no smooth evolution of a trajectory in spacetime will ever get to the end of time. We have suggested that chronos and chiros should intersect at the critical point where $x^0 = \infty$ and $\xi^4_+ = \Phi$. By moving the analysis to the other line we can definitely reach the critical point by smooth variation because Φ is a well defined finite number. Once at the critical point it is possible to analyze the local neighborhood in a way that is not possible in an analysis of the neighborhood around points that are very close to the critical point but in truth are still separated from it by an uncountable infinity of other points.

If a critical value of k is an irrational number it will be impossible to find it with a computerized solution to the equation. It will be impossible to find the behavior around the critical values of k by taking limits because we don't know what we need to take as the limit that k should go to. However, we do know the critical value exists and we can say that it marks the intersection with another number line at the value Φ. The onset of chaos finally arrives after infinitely many period doublings bring the period of the instability up to $T = 2^\infty T_0$ (figure 3) so we must further require that the two number lines intersect at Φ^n infinitely many times, on and on, until chaos starts at Φ^∞.

This is the inverse of the cosmological system. Here the last finite critical value of k meets the other number line at chirological infinity whereas in the cosmological setting the first discrete value on chiros meets the other number line at chronological infinity. Interesting.

In the cosmological system, the trajectory of particle comes from the past into the next moment so the geometry of spacetime should be brought forward as well. Perhaps when the phase Φ^2 on Ω is decomposed into two phase components Φ and 1, each of those terms will carry a sector. 1 is well suited to propagate a unitary quantum theory and since we are relying on the definition of the Einstein tensor $|\psi;\hat{\Phi}\rangle \mapsto G_{\mu\nu}$ [2, 3] it makes sense that Φ will propagate the geometry. If that is so, there should be a quadrupole moment tensor appearing somewhere near $\Omega \mapsto \aleph$, and perhaps the splitting of Φ^2 generates it along with an electromagnetic field strength tensor.

General relativity is a theory about points in spacetime but no states in Hilbert space have their location specified as a point. Just as the period doubling values of k can only be specified within some range, quantum theory never gives the probability of finding a particle at a certain place. The standard workaround to obtain definite position states is to introduce the Gelfand triple $\{\aleph, \mathcal{H}, \Omega\}$. The vector space Ω does admit states that are

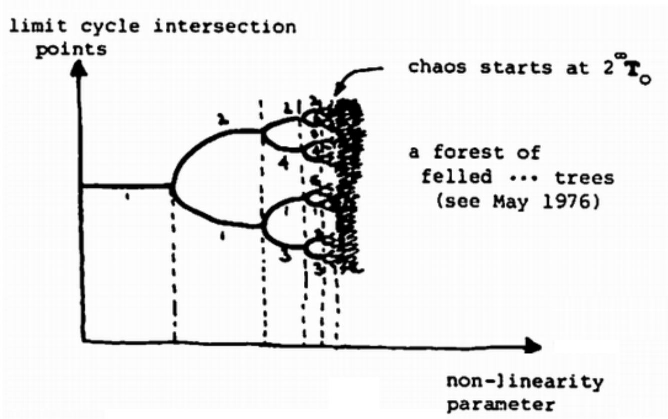

FIG. 3. The period doubling cascade [8].

located at spacetime points and its corresponding manifold Ω is where we expect chronos and chiros to intersect. We have no way to know exactly when the phase space of the convective system changes between any of the cycles shown in figures 1 and 2, and in general relativity we have no way to know when the phase space of a particle falling into a black hole changes to deny any future access to positions beyond the event horizon [1]. The systems are strikingly similar.

There are many other issues in physics well-suited to treatment with two number lines when a single number line leaves too many unanswered questions. How can a free neutron (a wavefunction of $\vec{x}$) suddenly decay to a proton, an electron, and a neutrino (a wavefunction of $\vec{x}_1$, $\vec{x}_2$, and $\vec{x}_3$)? How can classical electromagnetic field lines break off to form propagating waves when such lines are not allowed to cross or have sharp kinks? If dynamics on the one traditional number line are inherently symmetric, how can those dynamics possibly describe a natural world that is not symmetric under time conjugation? Regarding this final question, when the observer flips the dynamics on chronos to make a prediction for time reversed behavior, he will inevitably proceed to a higher level of $\aleph$ in chiros so that his formalism never predicts symmetry under time reversal. For example, if he knows what happened at t_i on the level of Φ^i and evolves that to t_{i+1} at Φ^{i+1}, and then reverses mathematical time to test for symmetry, the answer to that calculation will give the expectation for t_i at Φ^{i+2} which says nothing about a hypothetical reverse evolution back to t_i at Φ^i.

Note a further connection between the seemingly arbitrary example of convective rolls used in this section and the most general system in the modified cosmological model (MCM) [9, 10]. As concerning the first row of figure 1, the perfect cylinders in figure 4 are an approximation to the real observation but there should be something that can be learned about one system by studying the other. Instead of a temperature probe at an arbitrary location within the convective cell, the MCM describes an observer with an arbitrary probe fixed in the center of the cosmological cell. With convection we are able to start at low heat and view the transition to chaos but when the universe is the system the observer starts with chaos and wants to dig order out of it. This is a much more difficult problem.

When the geometry of the two universes seen in figure 4 is perturbed by matter-energy it should be possible to understand the effect of the perturbation, at least in part, as the superposition of instabilities on the past and future. In figure 1, the left and right cells are symmetric and all the derivatives on one side must connect smoothly with all the derivatives on the other side. In figure 4, the two rolls are expected to be disconnected by a topological obstruction in the center [1, 4] and we expect some subtle discontinuity somewhere such as that needed to generate the anti-gravity effects of mechanical precession [2].

Just as it is impossible to define a stable framework for analysis around the critical values of k without adding a second number line, it has been impossible to define a stable theory of everything that will describe all the aspects of Nature. We propose that a second number line is the missing conceptual component causing the ongoing theoretical failure and that it intersects the observer's proper timeline at the center of figure 4 in the direction perpendicular to the plane of the figure.

We have stated that the entropy of the cosmos is constant because the present is always the superposition of positive and negative time universes that increase and decrease in entropy in equal proportion [9]. Figure 4 shows two universes with two pasts and two futures but the cosmological unit cell in figure 5 only gives one past and one future. If we consider the two universe system there is no requirement that the chirological phase Φ^n specify the curvature parameters g_{44} but never vice versa. We can find a negative sign associated to $g_{44}|_\aleph$ because it is taken from a parallel but reversed system. Similarly we can get $g_{44}|_\mathcal{H} = 0$ by taking a superposition of positive and negative values.

More evidence for two number lines appears in a well known process for obtaining numerical solutions to second order differential equations. The observer separates the equation into a system of two first order equations so there is room for improving the motivations behind what is currently an *ad hoc* process. Since both formulations below give the same answer, we should not be too quick to say which is the fundamental one.

$$\ddot{x} = \frac{F}{m} \quad \mapsto \quad \begin{cases} \dot{x} &= v \\ \\ \dot{v} &= \dfrac{F}{m} \end{cases} \tag{13}$$

Note the velocity v is directly connected to the momentum p and that it is always possible to solve a system of

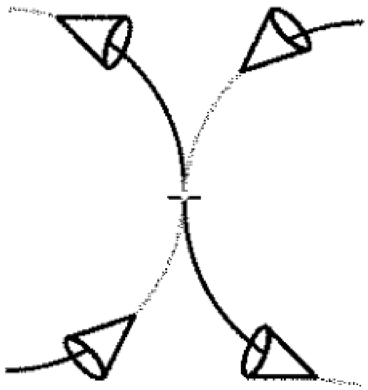

FIG. 4. The modified cosmological model defines the observable universe as the superposition of two unobservable universes moving in opposite directions through time.

two equations in two unknowns. To solve for more information than that which appears in quantum theory as $\hat{x}$ and $\hat{p}$, a third equation is needed to supplement the Schrödinger equation and boundary conditions that specify unique solutions. The same can be said for p and q in Hamiltonian theory; to solve for more information we need another equation. A first idea is to add a new component of time which will give a new equation, possibly something along the lines of $\hat{M}^3\psi = \hat{M}^3\Psi$ [2, 3].

The Fourier transform also shows how we already use two number lines and here the distinction between the line of smooth changes and the line of discrete elements is less subtle. A sinusoid wave that spans position space is a delta function in momentum space. Consider what Wikipedia has to say about the Fourier transform [11] and note the emphasis on the connection between frequency and angular frequency which is integral to our derivation of general relativity [2, 3].

> "In mathematics, one often does not think of any units as being attached to the two variables t and ξ. But in physical applications, ξ must have inverse units to the units of t. For example, if t is measured in seconds, ξ should be in cycles per second for the formulas here to be valid. If the scale of t is changed and t is measured in units of 2π seconds, then either ξ must be in the so-called 'angular frequency', or one must insert some constant scale factor into some of the formulas. If t is measured in units of length, then ξ must be in inverse length, e.g., wavenumbers. That is to say, there are two copies of the real line: one measured in one set of units, where t ranges, and the other in inverse units to the units of t, and which is the range of ξ. So these are two distinct copies of the real line, and cannot be identified with each other. Therefore, the Fourier transform goes from one space of functions to a different space of functions: functions which have a different domain of definition.
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> "In general, ξ must always be taken to be a linear form on the space of ts, which is to say that the second real line is the dual space of the first real line. [*sic*] This point of view becomes essential in generalizations of the Fourier transform to general symmetry groups, including the case of Fourier series.
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> "That there is no one preferred way (often, one says 'no canonical way') to compare the two copies of the real line which are involved in the Fourier transform – fixing the units on one line does not force the scale of the units on the other line – is the reason for the plethora of rival conventions on the definition of the Fourier transform. The various definitions resulting from different choices of units differ by various constants. If the units of t are in seconds but the units of ξ are in angular frequency, then the angular frequency variable is often denoted by one or another Greek letter, for example, $\omega = 2\pi\xi$ is quite common."

Where canonical methods of Fourier analysis make use of position and frequency spaces in an alternating fashion, we want to redesign the process so that both domains are important the whole time. Since we have only used half of figure 4 to describe the position space in figure 5, the other half is available for carrying information about momentum space.

Often the definition of the integrals to and from the frequency domain are prefaced with $(2\pi)^{-1/2}$ to suppress the factor of 2π that shows up in one Fourier integral but not the other. Also recall that in reference [12] we found Wick rotation can be avoided with the Lorentz signature $\{+ - --\}$ but the phase doesn't work out correctly if $\{- + ++\}$ is used. This preference for one sign convention over the other and the appearance of 2π in the non-unitarity preserving Fourier transform give us some clues about the direction, or ordering, of processes that must be assembled into an all-purpose algorithm for solving problems with the correct theory of everything, and also about the unresolved sign convention in our reanalysis of Bell's inequality [13].

In reference [1] we asked in a certain way, "Why should a dual vector be available for computational conjuring when specific creation operators are needed for the original vector?" If two number lines are the base system, obviously we should always have two vectors. If we begin

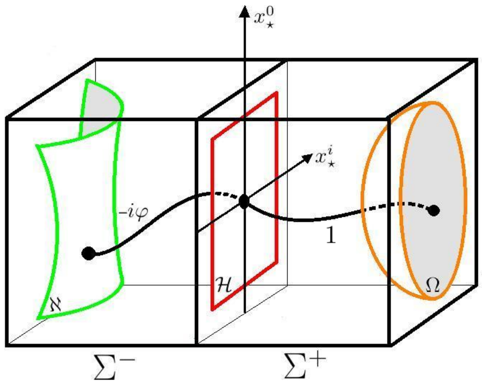

FIG. 5. This figure describes the cosmological neighborhood around $\mathcal{H}$ but since the left boundary is not the same as the right boundary it will not serve an illustration a primitive cosmological cell. For that purpose, we must consider the space between two $\mathcal{H}s$ which includes the space between Ω and $\aleph$ (if there is any). The directions to the right and left are ξ^4_+ and ξ^4_- respectively. The length of ξ^4 in Σ^+ has been redefined to 1 from the previous value Φ so that the total chirological interval between instances of $\mathcal{H}$ is $|-i\varphi|+1=\Phi$.

with only a vector but not a dual vector then a presupposed two number line system will be improperly specified. Since the quantum theory does, in fact, rely on the permanent coexistence of vectors with dual vectors, that is another small shred of evidence in favor of the theory of infinite complexity.

QUANTUM THEORY

Chronos has a characteristic value: the speed of light. It shows up as $x^0 \equiv ct$. Since it has units of meters per second, c is not a good guess for the most general characteristic value of the most general system on two number lines. If the Fourier transform is already scratching the surface of the most general structure, we should expect to have some dimensionless quantity that does fix the scaling relationship between the two number lines. This should be understood as "the ontological scale" and an obvious choice for the dimensionless parameter is the fine structure constant.

$$\alpha_{QED} = \frac{e^2}{4\pi\epsilon_0\hbar c} \tag{14}$$

$$\alpha_{MCM} = \frac{1}{2\pi + (\Phi\pi)^3} \tag{15}$$

We want to ignore $\hbar$ but it is good that the fine structure constant relates so many other characteristic values such as 4π and c and ϵ_0, and that c itself is defined by ϵ_0 and μ_0 or vice versa, and that in certain units $\epsilon_0 = 1/4\pi$ or $\mu_0 = 4\pi \times 10^{-7}$.

The speed of light tells us how fast something can move along the chronological line but things don't "move" along chiros, they translate discretely. We have previously defined the characteristic value associated with that translation as α_{MCM} [2]. Anything described by a regular set of discrete translations has an associated lattice and the most notable difference between a crystal lattice and the cosmological lattice is that the latter does not satisfy the Bravais condition $f(\vec{r}+\vec{R}) = f(\vec{r})$. A Bravais lattice has an additive periodicity but the cosmological lattice has a multiplicative periodicity.

The consecutive cosmological cells should grow in size in some way related to Φ [4, 7] and it remains to define precisely how a vector $\vec{r}$ in one level of $\aleph$ is related to the same vector at a later time $\vec{r'}$. Since the forward direction is a spiral, the lattice vectors that set the framework for modified parallel transport need to be pretty complicated. Considering that the lattice of $\hat{\pi}$-sites are the points in hyperspacetime where observations are made, there may be further lattice structure that is distinct from what has been treated already. Since we have only used $\hat{\pi}$ and $\hat{\Phi}$ to describe the electromagnetic and gravitational sectors, lattice structure associated with the vectors $\hat{2}$ and $\hat{\imath}$ may be useful in an eventual attempt to crank the hypercharge crank or toggle the isospin nozzle. Noting a further divergence from the normal lattice models of solid state physics, we point out that the duality of $\aleph$ with Ω, as opposed to that of $\mathcal{H}$ with itself, implies that the reciprocal of the cosmological reciprocal lattice will not be the direct cosmological lattice.

While aspects remain unclear, what is clear is that observation, prediction, waiting, and then observation again is a regular process that can be modeled on a lattice even if the familiar Bravais lattice is not the right one. Regardless of what is going on in other directions, $\hat{\pi}$ seems to point in the direction of the arrow of time and $\hat{\Phi}$ is a vector that starts on one $\hat{\pi}$-site and ends on the next one.

Consider that before a QFT software suite performs the final number crunching operation that returns a real-valued probability, the form of the mathematical entity in the computer's memory will be an expansion in the fine structure constant α_{QED} up to order N. We want to show that it is possible to generate such power series in α_{MCM} by accounting for effects in cosmological cells adjacent to the observer's present where the effects from the N^{th} nearest cell are scaled by α^N.

Why do terms like 137^{-N} appear in these series but never terms like 137^N? Perhaps the quantum mechanical part only attaches from the past so that the larger cells in the future going as 137^N don't contribute. The past has been described as the unitary component so this is a consistent explanation. If the future component is not unitary then it must augment the existing classical theory and not be one of the traditional unitary components. Also consider that there are two pasts in the MCM (figure

4) implying two such unitary components and perhaps the coefficients of α^N in the power series are determined from both.

The formal definition of the lattice can be arbitrarily complicated but it is bound to contain the periodicity $\mathcal{H} \mapsto \Omega \mapsto \aleph \mapsto \mathcal{H}$ so we know it is in some way regular. With that settled, at the end of the day, waves moving to the right will look like e^{ix} and waves moving to the left will look like e^{-ix}. When the waves get to the end of the regular unit there will be some transmission coefficient T and a reflection coefficient R that tell us everything we need to know.

A 1D plane wave looks like e^{ix} but the cosmological lattice needs solutions in very many dimensions so we should consider plane wave expansions of periodic functions in more than one dimension and we point the reader to page 762 of reference [14] where one finds a remarkable footnote. In the case of a function f on a Bravais lattice satisfying $f(\vec{r}+\vec{R}) = f(\vec{r})$, the function can be expanded as follows when $\vec{K}$ are reciprocal lattice vectors and $f_{\vec{K}}$ are the Fourier coefficients.

$$f(\vec{r}) = \sum_{\vec{K}} f_{\vec{K}}\, e^{i\vec{K}\cdot\vec{r}} \tag{16}$$

$$f_{\vec{K}} = \frac{1}{V}\int_C d\vec{r}\, e^{-i\vec{K}\cdot\vec{r}} f(\vec{r}) \tag{17}$$

The integral $\int_C d\vec{r}$ is over one unit cell and in the case of the cosmological lattice that should be understood as a modification of figure 5. For these purposes the unit cell is defined as the space between two instances of $\mathcal{H}$ but figure 5 only illustrates the neighborhood around one instance of $\mathcal{H}$. In equation (17), V is the volume of the unit cell in the Bravais lattice of additive periodicity and when it is adapted to the cosmological lattice of multiplicative periodicity we can expect a series of terms V^{-N} exactly like the analytical form of perturbative expansions in QED. It only remains to show how the volume could be $2\pi + (\Phi\pi)^3$ when volumes typically look like $(\Phi\pi)^3$ without the π and the other π added.

In references [2, 6] we outlined how the balling and unballing of the domain of quantum theory $\mathbb{C}^2$ into the Riemann sphere can be used to describe lattice translations. The observer starts at a $\hat{\pi}$-site: the origin of $\mathbb{C}^2$ where the real and imaginary number lines intersect. Since quantum states only describe 3D spatial slices of constant proper time, to select a point in the future he picks a bulk point p not planar on $\mathbb{C}^2$. The Riemann sphere is constructed conformally so that $\hat{\pi}_i$ is at the origin on one pole while both real and imaginary infinity go to the other pole at p. Since all vectors in Hilbert space are required to go to zero at infinity there is an information-preserving map between flat $\mathbb{C}^2$ and the surface of the sphere that is unaffected by the two-to-one map on infinity. Since the observer will never observe anything at the tip of the vector that points to his own position, there is a further information-preserving inversion operation that will swap the Riemann sphere's poles allowing the observer to reconstruct the plane of $\mathbb{C}^2$ at the previous location of the null point. By this process the observer carries information about his environment from one moment to the next but if there are qubits attached to the ends of the real and imaginary lines at the beginning of the process there is no guarantee that the same qubits will appear at the end of it.

The cosmological unit cell is defined between two instances of $\mathcal{H}$ centered on distinct $\hat{\pi}$-sites: $\hat{\pi}_1$ and $\hat{\pi}_2$ that were located at the poles of the Riemann sphere. Since the poles holding ontological vectors are in some way different than every other point on the sphere we can assume that the density function in the volume integral over the sphere is different at those points. Consider the volume of an ordinary sphere $\mathcal{O}$ of radius 1 where the density has a constant value $\rho = 1$ everywhere in the sphere.

$$V = \int_{\mathcal{O}} \rho\, dV = \frac{4\pi}{3} \tag{18}$$

Now consider the case when the density is different at the two polar points.

$$\rho = \begin{cases} 1, & \theta \neq 0, \pi \\ \gamma, & \theta = 0, \pi \end{cases} \tag{19}$$

For a piecewise density we need to split the volume integral up into pieces.

$$V' = \int_{\mathcal{O}'} dV + \int_{\theta=0} \gamma\, dV + \int_{\theta=\pi} \gamma\, dV \tag{20}$$

The first term in equation (20) will be equal to V because we have constructed $\mathcal{O}'$ by subtracting two points with zero volume from $\mathcal{O}$. Regarding the other two integrals, we have defined the object which describes the observer in the theory as a delta function [2] and the $\hat{\pi}$-sites are the locations of the observer. Therefore γ should take the form of a delta function which allows an integral over a single point to be non-zero. Since those points are $\hat{\pi}$-sites, let us say that the integral over γ returns π. If the cells are not to overlap then $\mathcal{O}$ must be missing one polar point so that consecutive $\mathcal{O}$s can be stacked without overlapping, *i.e.*, $\mathcal{O}$ is the Riemann sphere. In that case the integral over γ should give 2π which is also a good value since it is the starting point for the $\hat{2}\pi = \pi + \pi$ process mentioned above. However, the non-overlapping condition that is rigorously enforced on an additive lattice may be relaxed on a multiplicative lattice to allow the overlap of a single point.

The volume of the cosmological cell includes the two $\hat{\pi}$-sites but the volume is not limited to that of the sphere that carries the quantum sector from one moment to the next. The volume in question is everything that lies between the original location of $\mathbb{C}^2$ and its location after it has been folded, inverted, and then unfolded at $\hat{\pi}_{i+1}$. This at least gives us the sense of a rectangular volume element xyz as opposed the spherical volume $4\pi R^3/3$ that does not have the form of $(\Phi\pi)^3$. Furthermore, in precise mathematical terms, only balls have substantial volume; the Riemann sphere is the surface of a ball.

Since the volume should be dimensionless, chiros is the only real option and conveniently we have already defined three components for chiros [5] that can be used to assemble a dimensionless timecube between adjacent moments of chronological time as measured in units of spacetime interval.

$$\xi^4 \equiv \xi^4_- \otimes \varnothing \otimes \xi^4_+ \tag{21}$$

For our purposes we will replace $\varnothing$ with $\xi^\varnothing$ and note that $\Sigma^\pm$ aren't separated by nothing. Separated by nothing means "not separated" but we do want them to be separated by the thickness of one brane: $\mathcal{H}$. In the hyperreal number system that we are now using routinely, we don't need to take the thickness of $\mathcal{H}$ to be zero. However, consider that figure 4 contains slightly more than two copies of figure 5. Since $\Sigma^\pm$ do not contain their boundaries at $\xi^4 = 0$, there will be two planes left over when two copies of figure 5 are constructed from figure 4. Since we have defined $\mathcal{H}$ as a type of null space, or a soliton, between $\Sigma^\pm$ it is possible that we need to redefine so that the two extra planes go into the two empty slots $\mathcal{H}$. Another option is that this is an innate asymmetry of the cosmos that leads to an effect such as the non-zero baryon number of the universe.

Regarding the unresolved value $(\Phi\pi)^3$, consider that when using hyperreal numbers, the timecube should have an interpretation as a 3D delta function. $\hat{\pi}$ and $\hat{\Phi}$ are collocated on the observer pointing in the directions of chronos and chiros so it is easy to envision $(\Phi\pi)^3$ resulting from an integration over a 3D delta. Another option is that the timecube is the cosmological unit cell of integration in equation (17) and it has three delta functions at the tips of the three vectors that define the cube: two 1D deltas for chronos and chiros (or the past and future) and a 3D delta for the three dimensions of space. There are a lot of possibilities.

Consider the symmetry or anti-symmetry of a wavefunction. States in Hilbert space go to zero at infinity (finite probability) and at the origin (MCM condition), and thus half-planar waveforms can be rearranged by disconnecting them at the origin and reconnecting them at infinity without disturbing the original symmetry or anti-symmetry. By dealing with each half of the wavefunction separately, there exists some sufficiently complex representation where all wavefunctions are symmetric. By discretizing the topological components of the MCM it should be possible to recover anti-symmetric fermion wavefunctions from operations on halves of symmetric wavefunctions.

An obvious mechanism for the rearrangement is found in figure 4. Perhaps the observer understands his own timeline, which is full of the anti-symmetric wavefunctions of all the matter particles, as either the upper piecewise timeline moving to the right or the lower one moving to the left. We proposed that the negative sign in equation (9) might come from taking half of the left roll together with half of the right one and a negative sign is exactly what distinguishes an anti-symmetric wavefunction from a symmetric one. Perhaps difficult-to-describe fermion fields in the present can be more easily described with separate bosonic fields on the left and right temporal rolls. (As an aside, note that a piecewise function of the form describing either the upper or lower timeline is used as an example in reference [15].) Also consider that if there are two copies of the 14D system in figure 5 joined on chronos and chiros then their union will have $28 - 2 = 26$ spacetime dimensions as was expected in an early formulation of bosonic string theory.

$\hat{M}^3$ needs two instances of the wavefunction so it can return ω^3 when it operates on the chronological wavefunction and $i\pi\Phi^2$ when it operates on the chirological one. We have previously relied on the waving of hands to avoid the implication that only one frequency $\omega = \sqrt[3]{i\pi\Phi^2}$ is allowed but now we have a better option with $\omega^3|\psi\rangle = i\pi\Phi^2|\Psi\rangle$.

Let us consider chronological and chirological gauges. Note how easy it is to add arbitrary gauge freedom to the plane waves that are the solution to everything. If we have a solution of the form e^{ix} we can also use a solution of the form $e^{i\beta x}$ by rescaling everything else in the theory. It does not matter what β is. Zee presents gauge invariance as follows in reference [16].

> "We are now ready for one of the most important observations in the history of theoretical physics. Behold, the Lagrangian is left invariant by the gauge transformation
>
> $$\psi(x) \to e^{i\Lambda(x)}\psi(x) \tag{22}$$
>
> and
>
> $$A_\mu(x) \to A_\mu(x) + \frac{1}{e}\partial_\mu \Lambda(x) \tag{23}$$
>
> which implies
>
> $$F_{\mu\nu}(x) \to F_{\mu\nu}(x)\text{''} \tag{24}$$

When considering dynamics governed by the Lagrangian for quantum electrodynamics, the field strength tensor $F_{\mu\nu}$ remains invariant under these types of transformations. We are free to make them. In fact while "gauge" theory might be slightly hard to understand for laypersons, in reference [17] – coauthored by no less than Jackson – it is pointed out that "scale" is a better translation of the original German name for the theory. It is very easy to understand when the main result of "scale theory" is that we can rescale everything in the theory without breaking physics given that we always make a balancing rescaling elsewhere.

Given this fortuitous freedom, the following will be a solution to any problem that is solved by e^{ix} when we say $\Lambda = -i\xi\beta$.

$$\psi = e^{ix\xi\beta} \tag{25}$$

Gauge freedom allows us to hide the other variable when working with either chronos or chiros. We want to develop a new method for solving problems that requires us to alternate gauge between $\beta = 1/\xi$ and $\beta = 1/x$. This is completely normal and all that is required is to change the other objects in the theory when we do it.

Eigenstates of a Hamiltonian will have the form $e^{-i\omega t}$ so with this added complexity those eigenstates will look like $e^{-i\omega t\xi}$. We are only considering the values of ξ^4 where it is equal to Φ^n so we have a tier of frequencies $\omega_n = \Phi^n\omega$. This was described as the solution to the interpretation of the double slit experiment in reference [7].

If $\hat{M}^3$ returns ω^3 from the chronological wavefunction then $\hat{M}$ is just ∂_t and it doesn't need too much motivation when the wavefunction looks like $e^{-i\omega t}$.

$$\partial_t^3 e^{-i\omega t} = i\omega^3 e^{-i\omega t} \tag{26}$$

A more difficult question is how the operator shall return $i\pi\Phi^2$ in the form ∂_ξ^3? First note that since ξ^4 is not a continuous line like t, the operator ∂_ξ^3 is not well defined. To fix that we will use definition (21).

$$\partial_\xi^3 \equiv \partial_{\xi^+}\partial_{\xi^\varnothing}\partial_{\xi^-} \tag{27}$$

Now consider a wavefunction $e^{-i\beta G}$.

$$G \equiv (\omega t)(C^+\xi_+^4)(C^\varnothing\xi_\varnothing^4)(C^-\xi_-^4) \tag{28}$$

Take the convention that when we want the ∂_{ξ^+} derivative we have to work in the β_+ gauge as follows.

$$\beta_+ \equiv \frac{1}{(\omega t)(C^\varnothing\xi_\varnothing^4)(C^-\xi_-^4)} \tag{29}$$

$$\begin{aligned}\partial_{\xi^+} e^{-i\beta_+ G} &= \partial_{\xi^+} e^{-iC^+\xi_+^4} &(30)\\ &= -iC^+ e^{-i\beta G} &(31)\end{aligned}$$

Since the coefficients C are constants, all second and third derivatives appearing in the chain rule expansion of $\partial_\xi^3 e^{-i\beta G}$ will vanish leaving only one surviving term.

$$\partial_\xi^3 e^{-i\beta G} = iC^+C^\varnothing C^- e^{-i\beta G} \tag{32}$$

Given the structure of the objects in question it is not difficult to envision three chirological gauges which give the following, and which diverge from previous means of deriving the critical value $i\pi\Phi^2$ [2, 3].

$$\begin{aligned}C^+ &= \Phi &(33)\\ C^\varnothing &= \pi &(34)\\ C^- &= -\Phi &(35)\end{aligned}$$

We have chosen equation (35) as $-\Phi$ instead of φ because the derivative of a state in the present with respect to the past has to have the opposite sign to the same derivative taken with respect to the future.

$$\partial_\xi^3 e^{-i\beta G} = -i\pi\Phi^2 e^{-i\beta G} \tag{36}$$

Thus we only have to require that $\hat{M}^3$ employs the correct gauge behavior and that the chronological gauge is such that $\beta_t G = \omega t$ before we can use equations (26) and (36) to write the following.

$$\begin{aligned}-\omega^3|\psi;\hat{\pi}\rangle &= \pi\Phi^2|\Psi;\hat{\pi}\rangle \\ &= \pi\Phi|\Psi;\hat{\pi}\rangle + \pi|\Psi;\hat{\pi}\rangle &(37)\end{aligned}$$

We employ the familiar identities $\omega = 2\pi f$, $\hat{\pi} = \varphi\pi\hat{\Phi}$, and $\hat{\pi} = -i\pi\hat{i}$ to write the following.

$$-8\pi f^3|\psi;\hat{\pi}\rangle = |\Psi;\hat{\Phi}\rangle - i|\Psi;\hat{i}\rangle \tag{38}$$

This fourth derivation of general relativity demonstrates the exceptionally robust character of the result reported in reference [2].

$$\begin{aligned}-f^3|\psi;\hat{\pi}\rangle &\mapsto T_{\mu\nu} &(39)\\ |\Psi;\hat{\Phi}\rangle &\mapsto G_{\mu\nu} &(40)\\ -i|\Psi;\hat{i}\rangle &\mapsto g_{\mu\nu}\Lambda &(41)\end{aligned}$$

$$8\pi T_{\mu\nu} = G_{\mu\nu} + g_{\mu\nu}\Lambda \tag{42}$$

We hope the topological decomposition in equation (38) can be used to describe processes other than gravitation such as the splitting of a phase space trajectory with period T_0 into a similar one with period $2T_0$.

PERIOD THREE

Reference [15] gives proof that period three implies chaos. The proof deals with sequences of numbers that can be written in the form $x_{i+1} = F(x_i)$ where F is a map from J to J. A point $p \in J$ is periodic with period n if n and k are integers such that $p = F^n(p)$ and $p \neq F^k(p)$ for $1 \leq k < n$. Chaos is implied because the authors prove that the existence of points in J with period three implies the further existence of an uncountably infinite set of other points $S \in J$ which are not even asymptotically periodic – which is to say that they iterate chaotically.

In reference [18] Feynman's wavefunction integral doesn't have an obvious non-trivial periodicity but it does basically take the correct form $x_{i+1} = F(x_i)$. The value of ψ is a functional of the previous value of ψ.

$$\psi(x_{k+1}, t+\epsilon) = \frac{1}{A}\int e^{\left[i\mathcal{S}(x_{k+1},x_k)/\hbar\right]}\,\psi(x_k,t)dx_k \quad (43)$$

A founding element of the theory of infinite complexity is the assumption that Feynman has already developed the mathematical framework needed to derive equations of motion in the MCM system [9]. Above, instability in the present was compared to summed effects of instabilities on a set of convective fluid rolls and we also expect to model similar contributions from higher order trees and loops in Feynman diagrams [9] which need not be left-right symmetric.

Feynman's original paper [18] is one of the greatest papers of all time (and is worth a reread even if only to note how easy it will be to bring those ideas forward into the present framework) and even so, we call attention to an inadequacy of the original formalism that Feynman himself pointed to [18].

> "The formulation here suffers from a serious drawback. The mathematical concepts needed are new. At present it requires an unnatural and cumbersome division of the time interval to make the meaning of the equations clear."

While we continue to neglect any actual equations of motion, we do give heavy treatment to the issue of the division of the time interval. Consider Feynman's further words from reference [18].

> "Actually, the sum $[\mathcal{S} = \sum_i \mathcal{S}(x_{i+1}, x_i)]$, even for finite ϵ is infinite and hence meaningless (because of the infinite extent of time). This reflects further incompleteness of the postulates. We shall restrict ourselves to a finite but arbitrarily long time interval."

It is with this simplifying condition that Feynman derives equation (43) and our goal is to complete his postulates rather than to recompute them. Also note that regarding the odd instance of an additive factor of Φ connecting the chirological phase with the cosmological curvature, when $\mathcal{S}$ is expressed as a sum the corresponding amplitude will be a product.

We already have quantum evolution equations and geodesics that tell us where test particles will go so $\hat{M}^3$ isn't giving us that information. $\hat{M}^3$ tells us how to connect geometry to the quantum sector. To connect the objects of one theory with the other, note how the resolution of the identity which was used to expand the scalar value in equation (4) into a vector can also be used to expand a vector into a tensor.

$$\psi = \begin{pmatrix} \psi_\pi \\ \psi_\Phi \\ \psi_2 \\ \psi_i \end{pmatrix} = \begin{pmatrix} \frac{\psi_\pi}{4\pi} & \frac{\varphi\psi_\pi}{4} & \frac{\psi_\pi}{8} & -\frac{i\psi_\pi}{4} \\ \frac{\psi_\Phi}{4\pi} & \frac{\varphi\psi_\Phi}{4} & \frac{\psi_\Phi}{8} & -\frac{i\psi_\Phi}{4} \\ \frac{\psi_2}{4\pi} & \frac{\varphi\psi_2}{4} & \frac{\psi_2}{8} & -\frac{i\psi_2}{4} \\ \frac{\psi_i}{4\pi} & \frac{\varphi\psi_i}{4} & \frac{\psi_i}{8} & -\frac{i\psi_i}{4} \end{pmatrix} \quad (44)$$

The symmetry group of experimental particle physics relates to the MCM with SU(2) in the past, U(1) in the present, and SU(3) in the future [2] so we can expect some operation that cycles through the three forms of ψ given in equation (44). As a proxy for that complex process, define a lattice translation operator $\mathcal{F}$ that acts on chirological phase in the interval $J = [1, \Phi^2]$. Using the phase convention defined above, Φ is a periodic point with period three.

$$\mathcal{F}^3 : \Phi \mapsto \Phi^2 \mapsto 1 \mapsto \Phi \quad (45)$$

$$\Phi = \mathcal{F}^3(\Phi) \quad (46)$$

Feynman ran into a problem when time is chronologically infinite but here it is chirologically finite and we have proposed to integrate over the infinite interval in a finite way when $\mathcal{F}$ is a hidden sub-sector of equation (43). Since $\mathcal{F}$ is multiplicative but constrained by a corresponding additive connection to the curvature $\Phi^n \leftrightarrow g_{44}$, we expect that the stable physics of $\Phi = \mathcal{F}^{3n}(\Phi)$ as $n \to \infty$ will explode if the input to $\mathcal{F}$ is replaced by any "non-golden" value like $\Phi \pm \epsilon$.

Note that it is only at the cosmological lattice sites represented by $\{\aleph, \mathcal{H}, \Omega\}$ where g_{AB} has to have the form of a 4D metric tensor taken together with g_{44} and some potential vectors that form a coherent electromagnetic narrative across $\{\aleph, \mathcal{H}, \Omega\}$. These are the points in J with period three. We have not required that the components which represent potential vectors describe a valid electromagnetic potential when those components are sampled from the bulk.

Consider the interpretation of psychic powers as an observer's ability make observations away from $\hat{\pi}$-sites such as, for example, the act of keeping tabs on what will happen about 0.7 seconds in the future or listening to what someone else was thinking 0.7 microseconds ago. (Is it more likely that telepaths are in their targets' minds in real-time or that they are consuming information that the target has left on his past light cone?) Since there is an uncountably infinite number of points in J that aren't even asymptotically periodic [15], by sampling away from $\hat{\pi}$-sites the observer risks disrupting the stability of period three $p = F^3(p)$ by bringing in another perturbative operator F^* such that $p \neq F(F^*(F(p)))$.

DISCUSSION

The term "pre-science" has been introduced to pejoratively diminish (sometimes rightfully) the contributions of people who write papers that aren't filled with math that cannot be fully appreciated with a cursory optical inspection in the manner in which the neighboring words and (hopefully) sentences can. We want to offer another frame of reference.

In software development, tasks are divided between architects and coders. Architects get paid a lot more than coders. Offers of junior coding employment are made to those with little experience but any help wanted listing for an architect will insist that the candidate has very many years of experience. Once in the architecture role, the architect does not have to remember the minutiae of the syntax of the language that his subordinate coders will use to implement his software solutions. To be an architect, it is only required to know that code exists and what the inputs and outputs for a task should be; it is mostly irrelevant what language the coder uses and whether it accepts fancy apostrophes or not.

The critic will surely ask, "If the architect is so masterful, why doesn't he go ahead and write the code to prove himself right in the face of so many nay-sayers?" For that we will devolve into the first person. I did prove it already. It is proven with code. The simplicity and brevity of the proof is surely embarrassing to many who are infatuated with their own genius but it is proof nonetheless.

I haven't applied my concept to any "bigger" problems than I have for a number of reasons. I don't have a powerful computer so doing a lot of simulations is impractical. Even if I did, I don't know which software suite does what or how to install it or what to type at the command line to make it prove my theory. I haven't tried to crank out any solutions to big problems like Navier-Stokes or the Yang-Mills mass gap because I don't have a chalk board and my humongous, terrible handwriting is ill-suited to solving big problems on paper. Furthermore, I prefer to write in pen and ink doesn't erase the way pencil does so that is another big bottleneck to making long, involved calculations. About 90% of the theory of infinite complexity was worked out in my head.

I don't really know the closed form of whichever big problems are "the test" for a new theory being officially awesome or not. I could try to find what I think are the closed analytic forms of the unanswered questions that are the official test cases (and I did actually, that's what most of my papers were about) but how likely is it that I would select the correct mega-problems from a vast sea of uninteresting, mundane, self-referential technical literature that is often intentionally obfuscated by the peer-reviewing editorial process and unrelated self-aggrandizing exaggerations? I could have tried but I have chosen not to do so because, at best, it would take me hundreds or thousands of times longer to find the official condition for success on my own than it would take someone else who already knows what it is to explain it to me.

It has been a very biblical seven years since I submitted my first paper to *that website* in September 2009 and everyday since then I have woken up hoping to see myself in the news for dandily doing in a few pages what very many of the other smartest people on Earth were unable to do despite a century of considerable funding and concerted effort. It is true that if I had started looking into the complicated stuff then, I probably would have gotten it by now, but each day I don't do it the condition remains that someone else who already knows could explain it to me thousands of times faster than I could figure it out on my own, and I'm still hoping that will happen before I would finish if I started now.

I'm not saying, "Do the work for me." I'm saying, "Tell me what they are talking about at those conferences." Perhaps one asks, "Why should you expect success if you're not willing to do the work?" To that I would respond with great zeal, "I did do the work. Why are you ignoring it?" Since I have won the game of physics, I believe it is the place of the other physicists to seek me out and not vice versa. Why should I seek them out? What have they done except been told the information that no one told me?

So yes... I feel like I probably could have done something along those lines or gotten into an approved journal if I had been working on it the whole time for seven years but I have other interests such as abolishing the federal government of the United States of America and I just can't bring myself to invest months or years on something that someone else could explain to me in an hour or a day. I'm not talking about the solution to the problem; I don't even know which are the simple yet intractable problems that when solved, everyone will say, "Yes. There has been a breakthrough." In fact, I am still totally mystified that the paper I wrote in 2012 [2] wasn't exactly that, and neither were the two that followed in 2013 [4, 5]. What was Eric Weinstein's big accomplishment that year?

Relating again to the idea of "pre-science" (which hopefully was not invented to describe this research), I have done the hard part that no one else could do and there are literally tens of thousands of other people out there who can add the details they want to see, and who are getting paid to do that while I work in a field that requires absolutely no genius because Georgia Tech expelled me over some fucking bullshit, none of the very many publications of APS, IOP, and AIP to which I submitted manuscripts would peer-review me like they are supposed to, and the government has apparently decreed it a criminal act to point out that I did do a good job. Since they were unable to assassinate me in the years following their decree, this was not so much a policy error for them as it was an egregious blunder, hopefully a mortal one.

Regarding publishing in peer-reviewed journals, that is absolutely not required by the scientific method. Publishing in peer-reviewed journals and jumping through hoops for their editors is part of the bullshit you have to do for a career as a professional physicist and to keep your department's human resources lady off your back. I am not a professional physicist. If publishing in PRL will help your career then good for you but my boss doesn't give a fuck what my citation count is. My job already has its own bullshit so why I am going to go out of my way to put myself through the bullshit from your job too? If clicking the PDF button on viXra is too burdensome for you compared to clicking it on another website then don't do it. The fact is that even as a non-professional amateur physicist, I am still the most successful living physicist. As such the other physicists should embrace me but they are not and such are their prerogatives. The losing side of history must look good from over there.

The scientific method only says that I have to communicate my results and I have. The less successful physicists can continue to claim that since I haven't published in the venue that pleases them, that means I haven't yet published at all, but if that was true what are you reading right now and why are you reading it?

ACKNOWLEDGMENTS

The God of Abraham.

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