

## **General Relativity: Effects in Time as Causation**

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### **Abstract**

Time dilation formulas for stellar system orbital, and galactic rotation, velocities are derived from the gravitational time dilation and Vis-Viva formulas, as is the force in time from Newton's gravitational formula, the Hamiltonian and other formulas. The James Webb telescope discovery of galaxies CEERS-93316,  $z = 16.7$ , and GLASSz-13,  $z = 13.0$ , is proof of the validity of this model of the universe, as is LIGO'S Sept. 14, 2015 detection of a "gravity wave"<sup>4</sup>, and a proof of the nature of the evolving continuum is IBEX failing to find a shock wave at the edge of the heliopause as expected, as also might be the "dead zone" discovered by Voyager 1. As Einstein's Tensor is solely based on the time elements he calls his "energy components", only the effects in time are considered in this paper. Though it is noted that although the stress- energy tensor is not considered here, it is also scaled by the time elements,  $T^{44}$ . All space evolves forward with time in the forward direction of time. This is the evolving spacetime (quantum) continuum. The evolution of time is the primary, irresistible, force in the universe, as all space, and the spatial densities within, must evolve forward with the passage of time. This is the Fundamental Direction and Rate of Evolution, herein represented by Einstein's Fundamental Metric, which is the basis of the tensors describing a null gravitational field. The Heisenberg Uncertainty Principle allows for random fluctuations in time and when dilation gradients are introduced, we also see an evolution of events down gradient, a Gravitational Direction and Rate of Evolution. Although relativistic, it is an irresistible force in time just like the Fundamental Direction of Evolution. This is why gravity only has one direction and why it overpowers all the other forces, even though it seems so weak. So even though GR is based on the Equivalence Principle, the constancy of  $c$  and Lorentz transformations, the apparent effects of

the time elements also appear to manifest as a virtual flow in the forward direction of time down gravitational fields (dilation gradients) from areas of faster time. Dilation creates a density at the faster end due to contraction to maintain  $c$  and there is an increase in energy and pressure due to an increase in frequency. As the densities and motion appear when a dilation gradient is introduced, we see the manifestation of energy in the Kinetic form. Gravity then magnifies that energy by evolving the density down gradient into slower areas of time, giving the photons a greater relative frequency, energy and, therefore, mass. When the energy densities impede at the central focus of a spherical dilation gradient, the kinetic energy is converted to thermal energy through pressure. The GDE can only manifest orthogonal to the FDE as there is no space ahead of or behind the evolving continuum for the dilation gradient to appear in. The resultant of these two directions of evolution results in the curvature in evolution as per GR as the spacetime (here-in also quantum) continuum evolves forward. We have 2 event horizons we appear to evolve between where time appears to stop and we find a transition from timelike to lightlike to spacelike. We apparently evolve toward the event horizon of the galactic MECO (latest “black hole” advancement) and away from the outer, cosmic, horizon. The passage of proper time within our own, living, inertial frames has an acceleration aspect of  $\sim 2.2686 \times 10^{-18}$  s/s that manifests the Hubble shift through time dilation in older frames. The proof that the  $\sim 2.2686 \times 10^{-18}$  s/s acceleration in the inertial frame exists is in the fact that life forms grow up, against the GDE and gravity; against the gravitational forward direction of time. It is evident in every plant. A particle cannot move against gravity without acceleration. This manifests the same 1 s/s difference at  $\sim 13.9$  Gly looking outwards that we find at the event horizon of a MECO. This acceleration eliminates singularities and infinite expansions when added to the time elements of Einstein’s field equations. This is why we do not see MECO’s as singularities. They are just ever-deepening spiral vortices with empty space at the center. In both directions, past and future, there is a “Limit of Relativity” when the difference in the rate of time is 1 s/s because time appears to stop and no events are visible. It is not possible to get to a place where time stops, so both of these event horizons retreat when approached and the dilation gradient shifts, so if the 1 s/s limit is considered the edge of the universe, MECO’s are gateways to other universes without end. Galactic and planetary orbital velocities are explained mathematically through a proper application of time dilation within the continuum, rather than Newtonian physics in space. The origin of spacetime is explained. This is a new continuum-based model based on time dilation that eliminates LamdaCDM, CDM and Dark Energy.

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## Introduction

The singularity of the Big Bang and the universe expanding faster than the speed of light are nonsensical, as is Dark Matter. The evidence certainly seems to support these theories, but we are most likely misinterpreting what we are seeing. We also know the Standard Model is most likely wrong as CERN has produced no new results, the Higgs boson even being suspect.

Instead, this theory attempts to explain what we are seeing in the universe solely through relativistic effects in time, which is what the Einstein Tensor in General Relativity is solely reliant on.

Regarding gravity, I began thinking along these lines after studying Quantum Mechanics because Einstein translates the differences in the clock rates into angular deflection and velocity. He calls these his "energy" components. So even though General Relativity is based on the Equivalence Principle, the constancy of  $c$  and Lorentz contractions, the apparent effects of the differences in the time elements should also appear to manifest as a virtual direction in the forward evolution of time within the continuum. That virtual direction in a gravitational field is down the dilation gradient. This accounts for the fact that gravity only has one direction and why it overpowers the other forces so much even though it is so weak: it is an irresistible evolutionary force in time.

I had been working on a relativistic solution to the Hubble shift for some time and was surprised how simply it came together when a slight acceleration in the rate of time is considered an integral aspect in the passage of time in living things. When added to the time elements of Einstein's field equations, we then find ourselves in an eternal continuum evolving between 2 event horizons where the rate of time approaches 0, and we see a transition from timelike to spacelike, instead of a finite universe originating in an unknown singularity and then expanding out to infinity at an accelerating rate, which are absurdities.

Looking outward we see divergence as older, slower, galaxies slip from view, as we appear to evolve inward towards the event horizon of the

MECO<sup>5</sup> at the center of the Milky Way in the spiraling convergence of General Relativity, without the creation of a singularity. Each galaxy therefore is a branching of the forward evolution of the universe, and each event horizon the gateway to universes ad infinitum.

This is a totally new approach that only looks at the effects in time Relativity relies on, but in the evolving continuum instead of “in” space. The Big Bang enthusiast might at first find things “topsy turvy”, but I encourage them to read through.

Between March 8, 2021, when the time dilation formulas for the stellar system and galactic velocities were first sent out, and February 1, 2022, this paper had over 600 astrophysicist/astronomer downloads from a list of 350 in 33 English-speaking universities world-wide.

## About Einstein and General Relativity

“Reality is merely an illusion, albeit a very persistent one.”

Albert Einstein

Einstein’s field equations based on Lorentz transformations accurately describe the visual and dynamic *effects* of gravity on a particle moving within a stellar, spherical, gravitational field. The reason they do not seem to work on the galactic and cosmological scales is because the dynamics being described by General Relativity, GR, are not being fully understood in the time aspects as they relate to the evolving spacetime (quantum) continuum which go beyond the Equivalence Principle, the constancy of  $c$ , and Lorentz transformations. There are other perspectives in the time aspect that need to be considered.

I will be quoting Einstein’s 1915 paper on GR, “The Foundation of the Generalized Theory of Relativity”<sup>1</sup>, throughout this paper.

In § 16 of his paper, he says, “It must be admitted, that this introduction of the energy-tensor of matter *cannot be justified* (author’s italics) by means of the Relativity-Postulate alone....”. It is only used to provide a sense of the conservation of energy and momentum. Therefore, it will not be used in this paper. Only the relativistic effects in Einstein’s Tensor will be considered, as this is what GR describes. In § 15 of his 1915 paper, he calls the time dilation elements his “energy components” (his quotation marks), while considering the Hamiltonian function, and this paper focuses on those time elements. Einstein's tensor only contains spacetime elements, i.e.,  $x, y, z$  and  $t$ , and is the actual description of the evolution of events that "describe" the "effects" of gravity. Einstein's tensor describing gravity does not require the stress-energy tensor and the stress-energy tensor is meaningless without the corresponding Einstein tensor.

He also remarks in § 21, in his comparison to Newton’s theory as a first approximation, that, “The remarkable thing in the result is that in the first-approximation of motion of the material point only the component  $g_{44}$

of the fundamental tensor appears.”. This is the time-time element.

It is also the time-time element that determines relativistic mass in that for an object in freefall within a time dilation gradient, the velocity and rate of acceleration are determined by the difference in the rates of time between frames, just as the evolving geodesics describing the particle’s apparent motion are.

Though not considered herein, it should be noted that the stress- energy tensor is also scaled using the time elements to make it agree with the results of Einstein’s Tensor. It is the time elements that Relativity relies on.

In § 4 he states, “According to the general relativity theory, gravitation thus plays an exceptional role as distinguished from the others, especially the electromagnetic forces, in as much as the 10 functions  $g_{\sigma\tau}$  representing gravitation, define immediately the metrical properties of the four-dimensional region.”

This statement makes it clear that his equations only “represent” gravitation. When we accept the postulates of Special Relativity, SR, relative motion will manifest as per GR, and this fits the metrics of the changes in relationships in space we experience. It is simply what we must see based upon the evolution of events over time in a time dilated continuum. It is not a causation. The causation is the passage of time that evolves the spacetime (herein, also “quantum”) continuum forward. The evolution of time is the primary, irresistible, force of the universe. All of space, and the spatial densities within, must evolve forward with the passage of time, and it evolves forward at  $c$ , which is why light propagates at  $c$ , even with no shift from a moving source, and why it is an absolute universal speed limit. It is not possible for events to evolve forward faster than the continuum itself.

It is the author’s belief, for reasons delineated later, that the spacetime continuum is eternal. It is also a “singularity” whether it has the volume of a grain of sand, or has an infinite volume; i.e., even if it is expanded to infinity, the continuum is still a singular thing that only appears to have separate parts. Because it is a continuum, regardless of its volume, we can have quantum entanglement, superposition and dual wave/particle properties.

Since it is only an evolving continuum, an energy field, it has no actual depth. Spatial distances only appear in gravitational fields, as below. Consider a thin oil slick floating on water being gently heated from below. The spatial continuum is the oil slick and the evolution of time is the heat.

#### Einstein's Fundamental Metric

	X	Y	Z	T
X	-1	0	0	0
Y	0	-1	0	0
Z	0	0	-1	0
T	0	0	0	+1

We begin with considering Einstein's *in vacuo* state in his Fundamental Metric as representing the "Fundamental Direction and Rate of Evolution", or FDE, of a flat, non-time-dilated, spacetime, and by considering the constant rate of time in the metric to be the fundamental, universal, invariant, rate of time as experienced in any observer's inertial frame, as per the Equivalence Principle, and for the universe overall as a unit. This metric can be considered the basis of the tensors describing a null gravitational field where motion is undetectable and space appears dimensionless to the massless observer as there are no objects to compare distance or relative motion to. Plotted on a graph, it is the diagonal of a cube in the +X, +Y, +Z quadrant.

As this non-dilated spacetime continuum is at least *perceptually* infinite and eternal, Heisenberg's Uncertainty Principle, HUP, allows it to be full of an infinite potential energy, and time is the fundamental force of the universe as it forces all space to evolve forward with it. Einstein's General Relativity solution for the extra precession of Mercury's orbit is a proof that space evolves forward. As developed below, the fundamental rate of time includes a small acceleration aspect in living beings and that further energizes that evolution, and also manifests the Hubble shift.

Spacetime can be perceived to have substance as space expands and contracts in response to changes in the rate of time (tick rate), and the two aspects are cohesive and interdependent in that they must maintain a



proportionality to maintain  $c$ . There is a 1 s/s limit in the difference in the rates of time,  $dRt$ , between the inertial frame of the observer and any coordinate frame for them to remain timelike and visible to each other because at a 1 s/s  $dRt$  time appears to stop at the coordinate end and no motion (events) can remain visible. The 1 s/s  $dRt$  is herein called the “Limit of Relativity” and beyond that frames are spacelike and irrelevant to us. Outward, the limit of relativity is reached, at  $\sim 13.9$  Gly, due to the acceleration that manifests the Hubble shift, and inwards at the event horizon of a MECO<sup>5</sup> where the tick rate  $\rightarrow 0$  and the  $dRt \rightarrow 1$  s/s.

A MECO is a Magnetospheric Eternally Collapsing Object, the center of which is just empty space. It is the latest advancement in our understanding of what we used to consider to be “black holes”. It is beyond the scope of this paper to get fully into their physical aspects, which are well-documented by Astronomer Rudolph Schild of the Harvard–Smithsonian Center for Astrophysics, who led a team that was the first to find an intrinsic magnetic field in quasar Q0957=561<sup>6</sup> in 2006.

With the acceleration derived from the Hubble shift below, the universe appears to be eternal. Older frames diverge and slip from view at the outer edges where time appears to stop, while the forward evolution converges, spirals in, towards the apparent slower time of the MECO at the center of the Milky Way. Each galaxy can be seen as a different direction of evolution of the universe, a branching, and if we consider the limit of relativity of 1 s/s to be the “edge” of the universe, then they constitute gateways to other universes ad infinitum. This is because it is not possible to get to a place where time stops, and as you approach an event horizon, it shifts away from you as the dilation gradient shifts, so your individual universe always seems infinite and an event horizon can never be reached.

Moving outward towards the cosmic horizon, older frames just come into view and space seems to contract as their rate of time accelerates with proximity. Moving inward, the slower rate of time of the MECO causes lengths to expand as we approach and space appears to stretch out into the ever-deepening spiral gradient of the MECO. A singularity never forms in this direction due to the acceleration factor, as explained below.

Besides the inherent acceleration in the rate of time, HUP allows for random fluctuations in the rate of time. When the rate of time fluctuates, a dilation gradient is created which is orthogonal to the FDE of the continuum. It can only be orthogonal because, as above, spacetime is an evolving continuum and there is no space “ahead of” or “behind” the evolving continuum for the dilation gradient to appear “in”. The gradient can only appear “across” the FDE as viewed by an outside observer. When the dilation gradient is introduced, we also see an apparent evolution down the dilation gradient, a Gravitational Direction and Rate of Evolution, GDE.

Dilation creates a density at the faster end due to a length contraction necessary to maintain  $c$ , and an increase in energy and pressure due to an increase in frequency. As the densities and motion appear when a dilation gradient is introduced, we see the manifestation of kinetic energy. Gravity then magnifies that energy by evolving the density down gradient into slower areas of time, giving the photons a greater relative frequency, energy and, therefore, mass. They also appear to increase in velocity, as below.

Densities appear to evolve downgradient in a gravitational time dilation field because, to an outside observer, time is evolving forward faster, and therefore “first”, in the fastest rate-of-time frames. The next instant is “beginning” there and then perceptually flowing into slower time rate areas, seeking the shortest routes to the bottom of the time dilation gradients, evolving all densities down gradient with it. As space is cohesive and resistant to change, densities manifest an increased drag on the rate of evolution, slowing the tick rate within the density, and densities resist displacement from their FDE within the continuum.

Whereas the GDE always meets increasing resistance from ahead as it evolves through the drag of the slower tick rates of successive frames, accelerating them, the FDE always encounters increasing resistance from space itself as density increases within the continuum, from “behind”, and so is dragging the densities forward and also accelerating them. Both of these accelerations cause relative velocities to appear to increase as the gradient deepens. The velocities reflect the difference between the universal rate of evolution of the FDE and the apparent tick rate of the local frame, but, as per GR, velocities and tick rates change with perspective (See Appendix A). The orbital velocities within the GDE can therefore be perceived as being the

result of the FDE trying to evolve space forward at a constant rate of  $c$  throughout the continuum and this is mathematically demonstrated in the Orbital Velocities section below.

Gravity only has one direction because the GDE only flows downgradient. It overpowers the other forces so easily, even though it seems so weak in comparison, because it is an irresistible evolutionary force in time, and the curvature of motion we see manifested in GR is the resultant of the two evolutionary directions, fundamental and gravitational. GR can explain how we see this resultant evolution materialize given the postulates of SR, the constancy of  $c$  and Lorentz contractions because they all correlate to the effects in time, the Lorentz transformations being in both time and space.

In a spherical dilation pit, as density accumulates at the focus of the pit, the rate of evolution continues to decrease: the denser the space the slower the rate of evolution. This deepens the slope of the gradient at an accelerating rate as the density grows, making the event self-sustaining and self-accelerating. As densities impede at the central focus of the pit, the kinetic energy is translated into thermal energy as pressure increases.

Both the FDE and GDE are impeded at the focal point of the pit. The impedance is not complete because the FDE always precedes the GDE and the curvature of motion we see in GR develops into spins; spacetime vortices. On the stellar scale the resulting dynamics result in the formation of a star, and within the star, particle events as the  $dRt \rightarrow 1$  s/s at the Schwarzschild radius and time switches to being spacelike and space, timelike. This dynamic could conceptually occur on any scale, and the author postulates that standing waves in the CMB could form the primary matter nodes, manifesting virtual and elementary particles and clouds of such particles.

To accommodate  $c$ , the next instant must appear to flow down the gradient at  $c$ , otherwise light could not be propagated through the continuum at  $c$ . It is departing each frame at  $c$  relative to that frame's rate of time. As it moves into a slower adjacent frame, it accelerates the tick rate of that frame and the slower frame decelerates the tick rate of the flow by an equal amount. This equalization maintains the relative slope of the dilation gradient, which only changes as density increases at the center of the pit or the intersection of non-spherical gradients, as in flattened galaxies.

A proof of the dynamic developed herein is LIGO'S Sept. 14, 2015 detection<sup>4</sup> of a "gravity wave"; a distortion in spacetime consisting of fluctuations in the rate of time accompanied by distortions in space, shifting through the space time continuum at  $c$ . Space was proven to stretch with the dilation and compress with the acceleration, distorting the physical form of the antenna. This brief deceleration/acceleration is on top of the acceleration due to the FDE and GDE, as described above.

As above, events are not moving "through" or "in" a pre-existing space. Space is not "left behind" nor "moved into", it is evolved forward. The perception of moving "through" a pre-existing space is an illusion caused by the apparent evolution down the time dilation gradient and the 3- dimensional aspect of the continuum due to any observer being "centered" in the time dilated continuum, as we all are in our inertial frames. Without the gradient, there is no apparent evolutionary motion and no perception of depth, as above in the fundamental metric. This is the biggest flaw in perception in today's astrophysics. They do not see the quantum, spacetime, continuum evolving. They are still looking at particles moving through space over time instead.

When we see light lensing around a massive body, it is not moving "through" a distorted space, it is being evolved down the body's dilation gradient by the GDE as it passes through the gradient.

When driving down the road, the road is not there waiting for us. The road is also evolving forward, in the forward direction of time, in the continuum, always changing, but in the same place relative to adjacent frames so it is there for us as we evolve forward *and* move through the continuum relative to other events through the application of an external force. It evolves forward at the same rate we do, maintaining its relative position in time and space, because we occupy the same relative position in the dilation gradient and are therefore evolved forward at the same tick rate.

Masses are densities within the fabric of the continuum. When we "drive down the road", we are shifting our density *within* the continuum. This requires the application of force and there is resistance. The forward evolution in the direction of time of the continuum itself is due to the simple passage of time and no other force need be applied.

The stars and planets occupy relative tick rate levels, as determined by their relative densities and velocities, and evolve forward within the continuum at those rates, taking the shortest route in time. As above, all these factors change with a shift in perspective, as per GR (See Appendix A). They don't meet external resistance in the FDE because they have a slower tick rate than the surrounding space and they are instead putting a drag on the evolution of time, as above, and their velocities are the result of time trying to keep them evolving forward at  $c$ , as in the Orbital Velocity section, below.

The author postulates that it is because the solar system is not "moving through" space, but is evolving along with space, that IBEX<sup>2</sup> did not find a bow shock at the edge of the heliosphere, as was expected, and why Voyager 1 has entered a "dead zone"<sup>3</sup> where solar particles just seem to stop and Voyager 1 is not affected by the expected stellar winds.

When we accelerate into older, slower frames, those frames must appear to accelerate in their rate of evolution so we are in the present when we are within them. We are forcing them to accelerate in time and they resist this. The faster we accelerate, the faster we are requiring the frames we are entering to update and the more resistance we meet. The drag we feel while accelerating, which becomes infinite at  $c$ , is the drag of those frames as we try to shift our density within the continuum. We cannot force space to evolve at  $c$ , either in the FDE or GDE.

We also find that, where  $V_{RA}$  = apparent recessional velocity,  $V_{TA}$  = apparent transverse velocity,  $M_R$  = relativistic mass, and  $\alpha$  = angle of deflection, as per Einstein's Fundamental Metric, if the  $dRt = 0$  then  $\alpha$ ,  $V_{RA}$ , and  $V_{TA} = 0$ . At the event horizon of a MECO, where time appears to stop, as  $dRt \rightarrow 1$ ,  $\alpha \rightarrow 90^\circ$ , recessional  $V_{RA} \rightarrow c$ ,  $V_{TA} \rightarrow 0$ ,  $M_R \rightarrow \infty$  and space appears flat.

In the vicinity of a MECO, where  $dRt \rightarrow 1$ , events require a relative evolutionary velocity of near  $c$  to keep up with the FDE and remain connected by light (timelike) within our visual section of the continuum.

As a MECO appears to have an effective time rate of zero, events appear to stop and we see no forward evolution. But time cannot stop. As per SR, it has an invariant rate of 1 s/s in *any* inertial reference frame. which is the fundamental rate of the universe overall. The slowing is just a visual

effect due to us looking deep into the time dilation pit. The rate of time at what we perceive to be the event horizon is 1 s/s to an observer *at* the event horizon. Both time and space appear normal to him. We are always talking about *relative* rates of time.

To outside observers, the center of a MECO is perceived as empty space<sup>5</sup> with a zero temperature because no emissions can be detected. In this respect, it can be said that from the outside observer's perspective, the energy of events entering a MECO is transferred back into the potential of the spacetime continuum. In actuality, however, the events are still there. They just appear to disappear to the outside observer due to the effects of time dilation. We just cannot see events taking place in areas with a  $dRt \geq 1$ .

The empty space has been confirmed by Schild's team, who found a 4,000 AU wide apparently empty space at the center of the MECO<sup>5,6</sup>, though they propose different reasons for the void than this theory proposes. It therefore appears that a MECO *is* just an area of space where the  $dRt \rightarrow 1$ . Einstein believed you could just drive through a black hole without harm and Rudolph Schild and his team found the empty space to do that.

This is the reason MECOs can absorb each other; they are just space. If they were invariant mass they would obliterate each other like two planets colliding. This also solves the conservation of information problem for events "entering" MECOs.

### **The Hubble Shift**

Events always appear to be undergoing acceleration as they evolve forward in the time dilated continuum. This suggests that the passage of time itself involves an integral acceleration aspect; perhaps without the acceleration, we would not notice time passing, just as we do not feel gravitational effects at a steady velocity, but do when under acceleration. We do not detect this in our inertial frames as it is so small and is manifesting as part of the FDE's rate of time.

If this is true, when we look out into space beyond the local gravitational influences of the galaxy, and back in time, we are also looking down a time dilation gradient into slower time. The observer's (apparently invariant) relative rate of time is always faster than that in frames in the

perceived past, and we find that as  $D \rightarrow \sim 13.9 \text{ Gly}$ ,  $dRt \rightarrow 1 \text{ s/s}$ , recessional velocity  $V_{RA} \rightarrow c$ , and lateral velocity  $V_{LA} \rightarrow 0$ , just as it does near the event horizon of a MECO. Slower time results in lower frequency and the Hubble shift.

The Big Bang theorists say it is the accelerating expansion of the universe that Doppler shifts the light, but this is incorrect. They say recessional velocities can exceed  $c$  because the objects are not moving “through” space, but are embedded within an expanding space. This is also an incorrect view.

As above, Einstein's tensor only contains spacetime elements, i.e.,  $x, y, z$  and  $t$ , and is the actual description of the evolution of events that “describe” the “effects” of gravity. The Lorentz contractions are visual and depend on relative motion, regardless of its cause. Therefore, as  $V_{RA}$  appears to accelerate, relativistic effects are manifested, regardless of the cause of the  $V_{RA}$ . The object gets smaller and time dilation increases. As  $V_{RA} \rightarrow c$  the  $dRt \rightarrow 1 \text{ s/s}$  and time appears to stop and events are no longer visible. It is not possible to see them accelerate past  $c$ . To us, they cease to exist at  $c$ .

So, the dilation gradient being used here is real and present. This means we have two choices. Is the shift a Doppler effect in an illogical universe that began with an undefined singularity and is accelerating into infinite expansion, or is it a simple, logical, time dilation effect? If a Doppler effect, how then is the dilation effect accounted for? Would that not double the effect? Then if the dilation is present, which we know it is, the Doppler effect cannot be.

Assuming a Hubble constant,  $H_0$ , of  $70 \text{ km/s/Mpc}$ , we find the apparent recessional velocity reaches  $c$  at  $4282.7494 \text{ Mpc} = 13.968062372 \text{ Gly}$ . In the expansion model, what are the odds of the  $V_{RA} \rightarrow c$  just beyond the current age horizon of the universe of  $13.8 \text{ Gy}$ ? It is a certainty in the dilation model. Occam’s razor applies: the shift is simply due to time dilation due to the acceleration aspect of the passage of time.

For a  $1 \text{ s/s}$   $dRt$  at this distance the rate of change is:  
 $1/13968062372 = 7.1592 \cdot 10^{-11} \text{ s/s/ly} = 2.3349516024 \cdot 10^{-4} \text{ s/s/Mpc.}$ , so the  $dRt$  for  $1 \text{ Mpc} = 2.3349516024 \cdot 10^{-4} \text{ s/s}$  and:

$$c*(1 + dRt) = (299792.458) \text{ km/s} * ((1+(2.3349516024*10^{-4})) s =$$

$$299862.458 \text{ km and:}$$

$$299862.458 - 299792.458 = 70 \text{ km/s/Mpc} = H_0$$

Because we are always being accelerated forward in the rate of time, and therefore apparently space, events in the older frames must appear to accelerate away from us in the opposite direction.

This also creates the impression we are each at the center of our own universe and leading it in its evolution, which is relativity, each of us in our own reality: the other observer's meter is always shorter and clock slower and he only exists in the past. We can never see the other observer in the present.

Continuing from above, we find that:  
 $2.3349*10^{-4} \text{ s/s/Mpc} = 7.1592*10^{-11} \text{ s/s/ly} = 2.2686*10^{-18} \text{ s/s}$  acceleration within our inertial frames. This equates to a  $6.801091702188*10^{-10} \text{ m}$  contraction in space to maintain  $c$ . The proof that the  $\sim 2.2686*10^{-18} \text{ s/s}$  acceleration in the inertial frame exists is in the fact that life forms grow up, against the GDE and gravity; against the gravitational forward direction of time. It is not possible to move against gravity without acceleration. The proof is in every plant.

Since acceleration increases frequency, it can be seen to increase energy and density and, also, therefore, apparent pressure as it puts a constant pressure on space to compress.

Most importantly, when the acceleration is proportionately added to the proper and coordinate time elements of Einstein's field equations, based upon their individual relative rates of time, singularities and infinities are avoided because the geodesics are slightly distorted:

Where  $t_1$  = coordinate time and  $t_0$  = proper time, the time elements  $\Delta t_1 / \Delta t_0$  become:  $((((\Delta t_1 * ((1 + ((\Delta t_1 / \Delta t_0) * (2.2686 * 10^{-18})))))) / ((\Delta t_0 * (1 + (\Delta t_0 * 2.2686 * 10^{-18}))))$ .

For each second of  $\Delta t_0$  this becomes:  $((\Delta t_1 * (1 + 2.2686 * 10^{-18} \Delta t_1)) / ((1 + (2.2686 * 10^{-18})))$



This manifests as a net acceleration of the proper time relative to the coordinate time as the dilation gradient deepens and  $\Delta t_1 \rightarrow 0$ . It also causes the FDE to always precede the GDE, which relative rate of evolution to the FDE is determined by the slope of the dilation gradient. This prevents the FDE and GDE from coinciding and the subsequent formation of a singularity in a Big Crunch scenario both within a MECO, where we instead see the ever-tightening spiraling evolution, or the universe as a whole, which we see spiraling off in all directions in the galaxies.

Obversely, as  $\Delta t_1 \rightarrow \infty$ , infinite divergence is impossible as  $\Delta t_1$  is always divided by a sum  $> 1$ ; i.e.,  $\infty / (1 + 2.2686 * 10^{-18}) < \infty$ .

As dilation creates the impression of movement and dimensions in space, establishes the apparent direction of evolution and the limits of relativity, this inherent, steady, universal acceleration can be considered a foundational element of the universe as we perceive it.

## **Galactic & Stellar Orbital Velocities**

The masses of flattened spiral galaxy systems and spherical stellar systems have different shapes and, therefore, different shaped time dilation gradients and different apparent effects in the time aspect.

Within a stellar system, where the Lorentz transformations of GR work so well, as the dilation gradient deepens more quickly as the center of the dilation "pit" is approached, all events appear to accelerate increasingly in spacetime, appearing to evolve forward faster through their apparently faster velocities "through/in" space. The dilation gradient only equalizes in an infinitesimal focal point at the center of the star, impeding the forward evolution of events in all directions, concentrating energy.

The velocities are the result of time evolving the masses forward, compensating for the slower rate of time to maintain an evolutionary velocity of  $c$ . As above, the spacetime continuum evolves forward at  $c$  in the forward direction of time, which is why light propagates at  $c$ , even from a moving source, and why light is the cosmic speed limit.

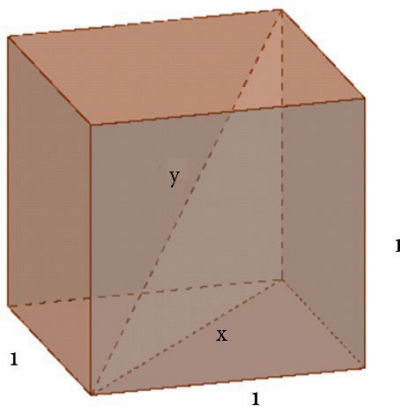
Since orbital velocity,  $V_O = \sqrt{GM/R}$ , the time dilation formulas for orbital velocities are derived from the gravitational time dilation formula,

$T_0 = T\sqrt{(1 - (2GM/Rc^2))}$ , which contains the velocity formula, by substituting  $V_0$  for  $GM/R$ , i.e.:

$T_0 = T\sqrt{(1 - ((2/c^2)(V_0)))}$ , resulting in:

$V_{Op} = \sqrt{2} * \sqrt{((Tc^2 - T_0c^2)/2T)}$ , for nearly circular planetary and moon velocities, where  $T=1$  is the distant observer's invariant rate of universal time,  $T_0$  is the rate of time of the coordinate point, and  $\sqrt{2}$  is the gravitational acceleration factor, due to the fact that the multipliers for the planets are in the range of Mercury = 1.41474412726671 and Neptune = 1.41379959891788, very close to  $\sqrt{2}$  at 1.4142, and what follows.

For the galactic formula, we go back to Einstein's Fundamental Metric and the diagonal of the cube it describes, **Fig.1**:



Assigning 1 km for the length of each side, we see that  $y = \sqrt{3}$  and  $x = \sqrt{2}$ , and we find that using  $V_{Og} = (\sqrt{((Tc^2 - T_0c^2)/2T)})/((\sqrt{3})/(\sqrt{2})) = (\sqrt{2} * \sqrt{((Tc^2 - T_0c^2)/2T)})/(\sqrt{3})$ , using the Sun's surface dilation factor, gives us the actual rotational velocity of 231 km/s for the Sun. (The dilation factor was for a radius of  $8.22428833 * 10^8$  m, which is  $1.27192 * 10^8$  m = 0.00018 of the radius above the surface of the Sun. I believe this is acceptable considering the Sun's dynamic nature and varying densities within its mass.)

Again, looking at the cube, Y is the Fundamental Direction of Evolution. The planets appear accelerated in the plane of the ecliptic, along X, at  $\sqrt{2}$ . The stellar system as a whole, centered on the Sun, is also being accelerated by a factor of  $\sqrt{2}$ , but it is along Y, the FDE, so the planetary result is divided by  $\sqrt{3}$ . As in the cube, this keeps the planets in the same

plane of evolution as the Sun and is the apparent velocity in the x,y,z dimensions. This formula is for stars whose own dilation gradient determines the velocity, instead of the central mass's gradient.

So, the equations are:

$V_{Op} = \sqrt{2 * \sqrt{((Tc^2 - T_0c^2)/2T)}}$ , for circular planetary and moon velocities and:

$V_{Og} = (\sqrt{2 * \sqrt{((Tc^2 - T_0c^2)/2T)})/(\sqrt{3})}$ , for galactic rotation velocities.

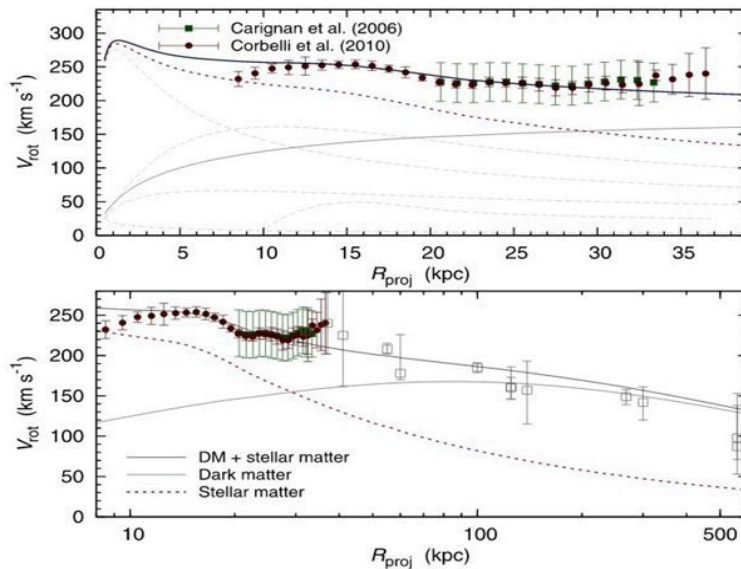
Since  $T=1$ , these formulas reduce to:

$V_{Op} = \sqrt{(c^2(1 - T_0))}$ , for circular planetary and moon orbital velocities and:

$V_{Og} = \sqrt{(c^2(1 - T_0))}/(\sqrt{3})$ , for galactic rotation velocities.

The galactic formula works for stars whose dilation gradient is deeper than the galaxy's at that epoch. In the inner galaxy, where Kepler's formulas work, the planetary formula should work. The transition appears to occur at the corotation circle. In Andromeda, M31, the corotation circle is at  $\sim 6$  kpc, and the curves in Fig. 7, below, show the velocity aberrations beginning at  $\sim 8$  kpc. However, the shape of the velocity curve seems to indicate they begin earlier and that the data is probably missing the earlier changes.

#### Tamm et al.: Visible and dark mass of M31<sup>7</sup>



**Fig. 7.** Observed rotation curve together with the maximum-stellar model, in which the stellar masses are 1.5 times higher than in the B07 model.

For cometary velocities, it is necessary to derive the time dilation velocity formula from the Vis-Viva equation, which is:  $V_{oc} = \sqrt{((2 * ((c^2(1 - T_0)) - ((c^2(1 - T_{0\alpha}))))))}$ , where  $T_0$  = the rate of time factor for “r” in the Vis-Viva equation and  $T_{0\alpha}$  = the rate of time factor for a distance equal to the length of the semi-major axis,  $\alpha$ .

Since this is the derivation for the Vis-Viva formula, it is the exact solution for any stellar system body when using the dilation gradient of the central mass of the stellar or planetary system.

If we imagine a cloud galaxy with nearly uniformly sized and spaced stars, we observe its particles to evolve forward over time with very little change occurring.

The particle events that constitute the stars, however, are all actually evolving forward in the FDE at  $c$ . The rate they appear to also evolve forward down dilation gradients varies with the slope of the gradient, but they are still evolving forward in the FDE at  $c$ .

In a binary system, the barycenter, or center of mass, between two stars of equal mass is halfway between them. This is also the point where their time dilation gradients have the same rate of time. As one star grows more massive, that point shifts farther from it, higher up in the dilation gradient towards what is now the faster rate of the smaller star.

The steepest possible gradient is a 1 s/s difference in the rates because at that point time appears to stop at the limit of relativity.

It is not possible for the smaller bodies to accelerate at or past  $c$  as the central body increases in mass and the difference in the rates of time approaches 1 s/s. If they exceeded  $c$ , they would also be evolving forward faster than the very fabric of the continuum, which is not possible.

In Einstein’s 1915 paper, by substituting X, Y, Z, T for his  $X_1, X_2, X_3, X_4$  in his Fundamental Metric, we get the basis of the tensors describing a null gravitational field:

$$\begin{array}{cccc} & X & Y & Z & T \\ X & -1 & 0 & 0 & 0 \end{array}$$

$$\begin{array}{ccccc}
 Y & 0 & -1 & 0 & 0 \\
 Z & 0 & 0 & -1 & 0 \\
 T & 0 & 0 & 0 & +1
 \end{array}$$

In flattened spiral galaxies, designating the Y axis as being orthogonal to the flat galactic disk, the dilation gradients along the +Y and -Y axes above and below the flat mass of the disk equalize within the disk and as the  $dRt \rightarrow 0$  along the Y axes,  $\Delta Y \rightarrow 0$ .

As  $\Delta Y = 0$  at  $Y = 0$  in the middle of the plane of the galactic disk, the Galactic Fundamental Metric within the disk of a flattened spiral galaxy is:

$$\begin{array}{ccccc}
 & X & Y & Z & T \\
 X & -1 & 0 & 0 & 0 \\
 Y & 0 & 0 & 0 & 0 \\
 Z & 0 & 0 & -1 & 0 \\
 T & 0 & 0 & 0 & +1
 \end{array}$$

As all the Y elements go to 0, this metric can be reduced to:

$$\begin{array}{ccc}
 X & Z & T \\
 -1 & 0 & 0 \\
 0 & -1 & 0 \\
 0 & 0 & +1
 \end{array}$$

As with Einstein's Fundamental Metric, this Galactic Fundamental Metric cannot be realized in finite space as it also represents a null gravitational field without time dilation.  $\Delta Y$  also never actually remains at 0 since particles oscillate above and below the plane of the galactic disk.

However, in this fundamental metric without Y elements, forward evolution can only proceed through the X and Z axes, which share a common plane, which is different than the cube diagonal mentioned above for the quadratic Fundamental Metric of GR, and we get circular motion

around the center of the galactic mass, orthogonal to the dilation gradients. Note that the orbits in a stellar system are also orthogonal to the dilation field. As above, the GDE can only manifest orthogonal to the FDE.

Although the primary dilation gradient is along the Y axes, as the disk flattens there is also a secondary gradient looking in from the edges. The evolutions in these directions form the bars of Sb galaxies.

As the +1 in Einstein's  $g_{44}$  element of the Fundamental Metric represents an invariable rate of time for all frames along all axes, the +1 of the  $g_{33}$  element in the Galactic Fundamental Metric represents an invariant rate of time along the X and Z axes. Within the galaxy's dynamic metric, which lacks the relatively deeply accelerating gradient of a stellar system, the time elements along the +Y and -Y axes at  $Y = 0$  change relative to the mass densities in the bulge and spiral arms.

Velocities appear slower between the arms, due to the faster rate of time, due to the shallower gradient. Within the arms, where densities are concentrated, the gradient is deeper along the Y axes and velocities appear accelerated more, as they do in a deeper gradient in a stellar system.

The  $g_{33}$  element varies slightly relative to the slope and depth of the gradients within the individual stellar systems. This slope effect also manifests the same as we see in a stellar system where relative velocity increases as the gradient of the slope deepens. A test of this would be that larger masses and groups of masses should therefore appear to be evolving forward faster, and appear to have higher velocities, relative to nearby smaller masses due to their deeper, steeper, individual gradients, and that is what we find.

In the above M31 (Andromeda) graphics, Fig. 7<sup>7</sup>, note how the velocities increase as mass density increases, slowing time.

In the galactic rotational velocity formula,  $V_{og} = \sqrt{(c^2(1 - T_0))/(\sqrt{3})}$ , as  $T_0$  decreases, velocity increases.

Galaxies are evolving densities in an eternal spacetime/quantum continuum. We don't see new galaxies being born from scratch. What we see is galaxies undergoing constant change due to the cauldron of events within them, i.e., the formation of molecular clouds that create new massive stars,

that explode, etc., and due to their interaction with other galaxies, i.e., collisions, near misses and long-distance gravitational interactions.

All the motions we see are spirals when we consider them relative to the CBM. Just as the planets form spirals as the solar system rotates around the galactic center, so, too, does the Sun form a spiral as the Milky Way also evolves forward relative to the CBM.

If we look again at Einstein's Fundamental Metric, and the diagonal of the cube it describes, Fig.1, we see, of course, that any change in the rate of time due to a density causes the diagonal to curve in the direction of the slower time. Since the particle is always primarily evolving forward in the forward direction of time, along  $y$ , that curvature of motion results in a spiral.

When the gravitational direction of evolution impedes on itself at the center of a spherical dilation pit, it has nowhere to go but into a spin. A MECO is a time vortex, and its spin creates its magnetic field by spinning space and the CMB. This is also why stars rotate on their axes. It is all evolutions in the forward directions of time, both fundamental and gravitational, that events follow.

The spins primarily manifest in 2 planes, around the axis of the 3rd plane. This leads to the flattened ellipses of the planetary orbits and flattened disks of spiral galaxies.

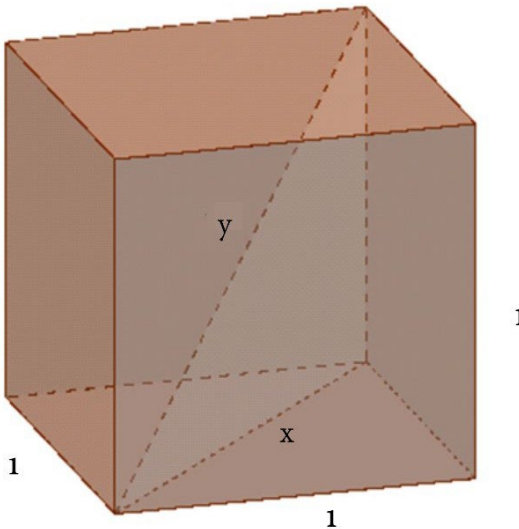
In galaxies, the spirals rotate as a unit and contain mixes of mass densities. They do not "sort themselves out". So, the galaxy is evolving in the forward direction of time as a system, just as the stellar systems are. We also see that spiral galaxies follow the Fibonacci sequence. This indicates a structural pattern, not a random pattern, prevails, as it does throughout nature. Realizing that densities slow time, what we see in the spiral arms are ripples, or waves, in the rate of time; gravity waves. This leads us to believe the spinning MECO creates the gravity waves according to the Fibonacci sequence, and the spiral arms form in the troughs of those waves.

In the Milky Way, the central black hole, Sgr A\*, has an accretion disk which is inclined  $\sim 23^\circ$  to the plane of the galaxy. If we go back to our cube that describes the Fundamental Metric, we see that  $y = \sqrt{3}$  and  $x = \sqrt{2}$ , where  $y$  equals the acceleration factor for the FDE and  $x =$  the acceleration factor for the dimensional planes, X, Y, Z, and the diagonal,  $y$ , forms a

35.264389682755 angle with the base XZ plane.

If we then divide the base angle by the average of the acceleration factors, we see we get the angle of inclination of the tilt of the accretion disk:

$$35.264389682755 / (((\sqrt{3}) + (\sqrt{2}))) / 2 = 22.4166729405548292^\circ$$



This leads us to believe it is the difference between the acceleration factors that creates the inclination.

It is also apparent that the precession of the tilted accretion disk would generate the gravity waves that form the basis of the spiral arms. If this is so, then we should expect a tilted accretion disk in all spiral galaxies and, if it is the difference in the acceleration factors creating that tilt, then all spiral galaxy accretion disks should have an inclination of  $\sim 23^\circ$  to their galactic planes.

To summarize, this leaves us with a cosmic hurricane, a rotating time vortex spinning space and the CMB, creating a Magnetic Eternally Collapsing Object (MECO), the spin of the CMB generating the magnetic field, and gravity waves that contain particles in the troughs, whose individual velocities are determined by their own densities or the dilation gradient of the central mass, whichever is deeper. The dynamics between the particles in the arms, gravitational and Coriolis, where leading edges become trailing edges, etc., account for larger particles not evolving out of the arms, i.e., for the arms' stability.



It should also be noted that the MECO has a higher velocity, relative to the CBM, than its constituent stellar systems, the Sun being at ~368 km/s compared to the Milky Way's ~628 km/s. The point being that the higher the mass, the higher the apparent velocity, as time works to evolve the continuum forward at  $c$  in all the systems within systems, within systems.

### The Force in Time

$$F = G(M_1 m_2) / R^2$$

Where  $M_1$  = Earth Mass,  $m_2$  = Moon Mass,  $R$  = Moon Mean Orbit Radius:

$$((6.6723 \cdot 10^{-11}) \cdot (5.9722 \cdot 10^{24}) \cdot (0.07346 \cdot 10^{24})) / ((3.844 \cdot 10^8)^2) = 1.98104 \cdot 10^{20} \text{ N}$$

$$F = (((M_1 m_2)(R_E)(c^2)(dRt_E) / M_\odot)) / (R_M^2)$$

Where  $M_1$  = Earth Mass,  $m_2$  = Moon Mass,  $R_E$  = Earth Orbit Radius,  $dRt_E$  =  $dRt$  of Earth coordinate point from Sun,  $M_\odot$  = Sun Mass,  $R_M$  = Moon Mean Orbit Radius:

$$(((0.07346 \cdot 10^{24}) \cdot (5.9722 \cdot 10^{24})) \cdot (((1.49598262 \cdot 10^{11})(299792458^2) \cdot (0.000000009870603)) / ((1.989 \cdot 10^{30}))) / ((2.844 \cdot 10^8)^2) = 1.98104 \cdot 10^{20} \text{ N}$$

### The Mass Inside a Galactic Stellar Circle

As per:

<https://academic.oup.com/pasj/article/69/1/R1/2632658> :

“An approximate estimation of the mass inside the solar circle can be obtained for a set of parameters of  $R_0 = 8$  kpc and  $V_0 = 200$  to  $238 \text{ km s}^{-1}$ , assuming spherical distribution of mass, as

$$M_0 = R_0 V^2 / G = (7.44 \text{ to } 1.05) \times 10^{10} M_\odot \sim 10^{11} M_\odot$$

with  $G$  being the gravitational constant, and the solar rotation velocity  $V_0$  being related to  $R_0$  as  $V_0 = (A - B)R_0$ , where  $A$  and  $B$  are the Oort's constants (Oort 1965), which are determined by measuring the radial velocity and proper motion of a nearby star. See Kerr and Lynden-Bell (1986) for a review regarding the Oort constants, and tables [1](#) and [2](#) for recent values.”

Using:

231 km/s for the Sun's  $V_0$ ,

1 kpc =  $3.08567758128 \cdot 10^{19} \text{ m}$

At 8 kpc in the Milky Way, for the Sun:

$$M_0 = (R \cdot V^2) / G =$$

$$((2.468542065024 \cdot 10^{20}) \cdot (231000^2)) / (6.67430 \cdot 10^{-11}) =$$

$$1.97359832689189374166579266739583177262034 \cdot 10^{41} \text{ kg} =$$

$$9.9225657460 * 10^{10} M_{\odot}$$

$V_s$

$$M_o = ((c^2 (R - T_0))/G =$$

$$((2.468542065024 * 10^{20}) * (299792458^2) -$$

$$(0.9999994062788036 * 299792458^2)) / (6.67430 * 10^{-11}) =$$

$$1.97359832685608858237940840531023542229746 * 10^{41} \text{ kg} =$$

$$9.9225657458 * 10^{10} M_{\odot}$$

Where:

$$V = \sqrt{(c^2 - T_0 c^2)}$$

$$T_0 = 1 - V^2/c^2$$

M31 at corotation = 6 kpc:

$$M_o = (R * V^2)/G =$$

$$((1.851406548768 * 10^{20}) * (239000^2)) / (6.67430 * 10^{-11}) =$$

$$1.58449865112711337518541270245568823696867 * 10^{41} \text{ kg} =$$

$$7.9663079493 * 10^{10} M_{\odot}$$

VS

$$M_o = ((c^2 (R - T_0))/G =$$

$$((2.468542065024 * 10^{20}) * (299792458^2) -$$

$$(0.9999994062788036 * 299792458^2)) / (6.67430 * 10^{-11}) =$$

$$1.58449865108127202096258645581425443195541 * 10^{41} \text{ kg} =$$

$$7.9667084875 * 10^{10} M_{\odot}$$

### **$E = mc^2 * \sqrt{(1+v^2/c^2)}$ as a Velocity**

Einstein's  $E = mc^2 * \sqrt{(1+v^2/c^2)}$  is a velocity formula. In a gravitational dilation gradient,  $v^2 = c^2 - c^2 T_0 = c^2(1 - T_0)$ , so we get  $E = mc^2 * \sqrt{((1 + c^2(1 - T_0)/c^2))} = mc^2 * \sqrt{((1 + c^2(1 - T_0)/c^2))} = mc^2 * \sqrt{((1 + (1 - T_0))}$ .

When  $T_0 = 1$ ,  $v = 0$  and  $E = mc^2$ . This is not a "rest" energy, but the energy expended by time evolving the mass forward at  $c$  with the rest of the continuum, without the induced velocity factor. If  $m = 0$ , there is no energy expended.

In the relativistic formula  $E_K = mc^2(\gamma - 1)$  where  $\gamma = (1 - v^2/c^2)^{-1/2}$ ,  $E_K$  is the energy expended by time inducing the velocity of the particle, compensating for the slower rate of time.

## Computing the Mass/Radius Ratio of a Star

For stars whose own dilation gradient determines the galactic rotation velocities,  $V_{og}$ :

$$V_{og} = \sqrt{(c^2(1 - T_0))/(\sqrt{3})},$$

$$\text{Therefore: } T_0 = 1 - (3*(V_{Go})^2/c^2)$$

As  $T_0 = T\sqrt{(1 - (2GM/Rc^2))}$  is also true,

$$1 - (3*(V_{Go})^2/c^2) = \sqrt{(1 - (2GM/Rc^2))} \text{ when } T = 1$$

$$\text{Therefore: } M/R = c^2(1 - (1 - (3*(V_{Go})^2/c^2))^2)/2G$$

For the Sun, using a radius of  $8.22428833*10^8$ , as used to derive the galactic rotation velocity formula above:

$$M/R = (1.989*10^{30})/(8.22428833*10^8) = 2.418446338687641803530*10^{21} \text{ kg/m}$$

Using the M/R formula derived above:

$$M/R = 2.398496582907570831398*10^{21} \text{ kg/m}$$

As the M/R formula provides the correct answer and also contains  $(\sqrt{3})$  as a factor in its derivation, it justifies the use of that factor in the galactic rotation velocity formula.

## The Hamiltonian

$$H = \sum_i \frac{P_i^2}{2m_i} + \sum_{i<j} V(r_i - r_j)$$

$$V = \text{potential energy} = -m_i c^2(1 - T_{oi})$$

$$\text{As } P = m_i v, P = m_i c \sqrt{(1 - T_{oi})}$$

$$P^2 = (m_i c)^2 * (1 - T_{oi})$$

$$H = \sum_i ((m_i c)^2 * (1 - T_{oi})) / 2m_i + \sum_{i<j} ((m_i c^2(1 - T_{oi}))(r_i - r_j)$$

$$\text{and } ((m_i c)^2 * (1 - T_{oi})) / 2m_i = ((m_i^2 c^2)(1 - T_{oi})) / 2m_i = ((m_i c^2(1 - T_{oi})) / 2$$

Therefore:

$$H = \sum_i ((m_i c^2(1 - T_{oi})) / 2) + \sum_{i<j} ((m_i c^2(1 - T_{oi}))(r_i - r_j)$$

## The Origin of Spacetime

Einstein's Fundamental Metric

	X	Y	Z	T
X	-1	0	0	0

$$\begin{array}{rcccc}
 Y & 0 & -1 & 0 & 0 \\
 Z & 0 & 0 & -1 & 0 \\
 T & 0 & 0 & 0 & +1
 \end{array}$$

A particle moves in a straight line in this Fundamental Metric, where there is no time dilation; where the time-time element  $g_{44} = +1$ , which is an invariant 1 s/s rate in all frames, the same rate we each experience in our inertial frame as we evolve along our worldline. It represents a null gravitational field. Though a useful tool in GR, Einstein admits this metric most likely cannot exist in finite space. If it did, there would just be a single, infinitesimal, particle, and it would have a zero velocity, regardless of the X, Y, Z components of the metric, as there would be nothing to relate its motion to. Space would appear flat and have no dimensions as there would be nothing else to relate distance to. He considers this situation to be *in vacuo*. In saying this state probably cannot exist in a finite region, he is confirming the author's conjecture that the spacetime continuum is energetic. It cannot be otherwise.

Because no motion would be apparent in the Fundamental Metric, it can be reduced to just the time-time element,  $g_{44}$ , which is simply  $TT = 1$ . An observer existing in this state would only be aware of time passing. The observer's space would be evolving forward with time, but that would be undetectable. The author calls this the IATIA state: "I Am That I Am". This will raise some objections, but it must be noted that our reality is an illusion being manifested out of superposition waveforms that only take on forms that are dependent on an observer being present. Again, as per Einstein, "Reality is merely an illusion, albeit a very persistent one."

So, although what follows is anathema to many physicists, if it is true it is necessary to properly understand what we are trying to describe with our science. If it is true and never accepted, then our science will never fully explain our experience.

What eternally promulgates spacetime?

The author has had proof positive in his life experience that what he is about to say is true: faith gives us divine power. Doctors depend on it and

casino owners hate it. This has also been proven by others, repeatedly, throughout the world, throughout history, in the laboratory of life, which he believes should satisfy scientific criteria. Miracles do happen.

This is because spacetime is created by the awareness of being “here”, space, and “now”, time. There is a primary awareness that exists only because it is aware of time passing. No light, no senses, just self-awareness. This is the “I Am That I Am”.

This is a horrible state of being. The worst thing we do to people is to put them in solitary confinement.

Fortunately, it can imagine light and alter its perception of rates of time to stretch the light to give its space depth and otherwise manipulate the light to create worlds that it can incarnate itself into, “losing” itself to escape its eternal loneliness and pass its eternity. All life forms are just different points of view, different perspectives for that single awareness. Hence, we are all one in it and we are all its children and, hence, in faith we have divine power.

Because we are all one in it, it harmonizes our universes. This explains non-locality. Alice and Bob have harmonized experiences, regardless of the apparent distance between them, because they are one-and-the-same in the Creator that is harmonizing their points of view.

The universe evolves forward beneficially for us when we *believe* it will. We are all brought forth as infants who must be carefully succored and this initiates us into faith. We are born into a totally loving, caring, supportive world. A guilty conscience initiates doubt, which is the opposite of faith, and it can manifest devastating effects.

The science is part of the illusion, but it enables us to manipulate things in such a way as to make our lives much fuller and better in innumerable ways. Ultimately, though, it works because we believe it does.

The reason we all hate boredom and fear loneliness is because we are of and from that eternally alone being. If you would know the Creator, know yourself.

The Kingdom of Heaven is *within* you. It is *your* faith that makes you whole. If you want proof, *ask* for something reasonable. Remember to say, “Thank you”, when you get it.

## **Appendix A**

### **Relative Velocities of the Planets From Different Perspectives**

Since relative velocity changes with a change in perspective, the relative rate of time must, too.

Considering relative velocity and rates of evolution within the continuum, in the following computations:

Planetary orbital radii and periods are as per NASA.

Orbital periods are related to 1 Earth year.

Orbital lengths are as perceived “around the Sun”.

Helical orbital lengths are computed using the following formula:

$$(\text{Distance travelled by the Sun in 1 orbit of the planet})^2 + (\text{Orbital diameter})^2 = (\text{Helical length})^2$$

The distance travelled by the Sun is relative to the CMB. Sun

$$\text{velocity} = 368 \text{ km/s} = 11.60672 * 10^9 \text{ km/yr.}$$

Considering the perspective of the orbits of Mercury and Venus relative to the plane of the ecliptic, we assign Mercury a velocity of 47.89 km/s and Venus one of 35.03 km/s, a large difference.

But if we consider the velocity of the Sun and its forward evolution in time relative to the CMB, and the helical distances travelled by the planets we get a much different perspective:

#### **Mercury:**

Orbital Radius:  $5.7909227 * 10^7$  km

Orbital period = .24 yr

Orbits/yr = 4.1666

Total orbital length =  $3.62513944 * 10^8$  km

Helical length =  $2.79072436 \times 10^9$  km in 1 orbit  
 Velocity = 369.4917 km/s vs 47.89 km/s

**Venus:**

Orbital radius:  $1.08209475 \times 10^8$  km  
 Orbital period = .62 yr  
 Orbits/yr = 1.6129  
 Total orbital length =  $6.85004644 \times 10^8$  km  
 Helical length =  $7.20626169 \times 10^9$  km in 1 orbit  
 Velocity = 368.2613 km/s vs 35.03 km/s

**Earth:**

Orbital radius:  $1.49598262 \times 10^8$  km  
 Orbital period = 1 yr  
 Orbits/yr = 1  
 Total orbital length =  $9.39576600 \times 10^8$  km  
 Helical length =  $1.16447182 \times 10^{10}$  km in 1 orbit  
 Velocity = 369.2047 km/s vs 29.79 km/s

**Mars:**

Orbital radius:  $2.27943824 \times 10^8$  km  
 Orbital period = 1.88 yr  
 Orbits/yr = .5319  
 Total orbital length =  $1.43079318 \times 10^9$  km  
 Helical length =  $2.18461461 \times 10^{10}$  km in 1 orbit  
 Velocity = 368.1261 km/s vs 24.13 km/s

**Jupiter:**

Orbital radius:  $7.78340821 \times 10^8$  km  
 Orbital period = 11.86 yr  
 Orbits/yr = 0.0843  
 Total orbital length =  $4.88528106 \times 10^9$  km  
 Helical length =  $1.37795427 \times 10^{11}$  km in 1 orbit  
 Velocity = 368.0369 km/s vs 13.06 km/s

**Saturn:**

Orbital radius:  $1.426666422 \times 10^9$  km  
 Orbital period = 29.46 yr

Orbits/yr = 0.0339  
 Total orbital length =  $8.95718338 \times 10^9$  km  
 Helical length =  $3.42271105 \times 10^{11}$  km in 1 orbit  
 Velocity = 368.0201 km/s vs 9.64 km/s

### **Uranus:**

Orbital radius:  $2.870658186 \times 10^9$  km  
 Orbital period = 84.01 yr  
 Orbits/yr = .0199  
 Total orbital length =  $1.80442895 \times 10^{10}$  km  
 Helical length =  $9.76024904 \times 10^{11}$  km in 1 orbit  
 Velocity = 368.0100 km/s vs 6.81 km/s

### **Neptune**

Orbital radius:  $4.498396441 \times 10^9$  km  
 Orbital period = 164.8 yr  
 Orbits/yr = 0.0060  
 Total orbital length =  $2.82240106 \times 10^{10}$  km  
 Helical length =  $1.91282069 \times 10^{12}$  km in 1 orbit  
 Velocity = 368.0063 km/s vs 5.43 km/s

From this perspective, the velocities, or rate of evolution, of Mercury and Venus are only .038 km/s different. Note also that as we increase distance from the Sun, the velocities decrease until Neptune has a velocity only .001 km/s different from the base velocity of the Sun. Relative velocities equalize with a larger perspective. If we shift out to the local group and its apparent motion relative to the CMB of 627 km/s, the difference between the Sun and Neptune's velocity is only .00059 km/s.

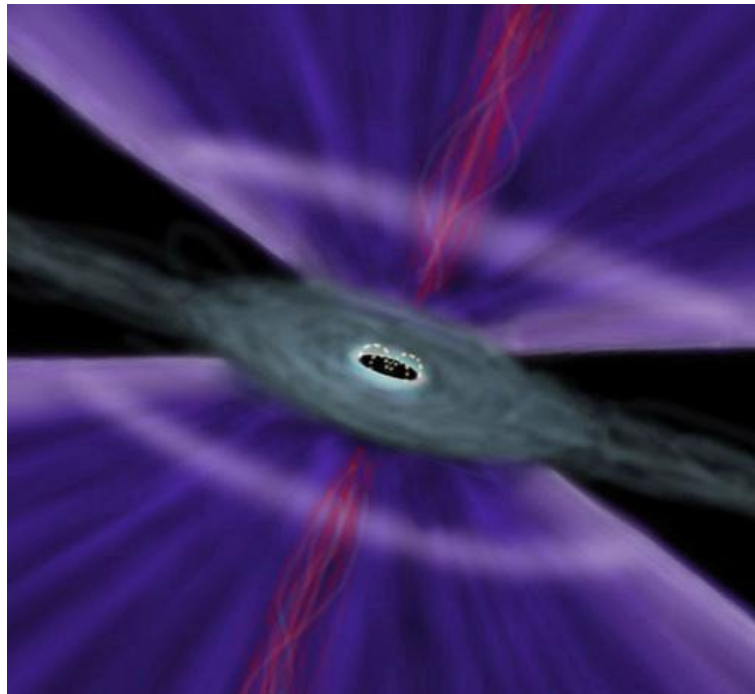
In both perspectives, the velocity and acceleration are directly related to the  $dRt/distance$  so are higher in steeper gradients, and this higher apparent acceleration of events in slower time frames maintains their relative positions within the overall continuum as it evolves forward as viewed from both perspectives.

This means GR is describing the forward evolution of the continuum and the events occurring within it, rather than the evolution of events



through pre-existing “curved spacetime”. It is not the masses that determine relative velocities and trajectories, but the dynamics and perspectives in time.

## Appendix B



### Magnetic Eternally Collapsing Object (MECO)

“Schematic figure demonstrating the principal luminous quasar structures as determined by our (Schild’s team) reverberation-microlensing analysis. The dark compact central object is surrounded by dipole field lines (dotted yellow) and the sharp luminous ring at the inner edge of the accretion disc is white. A dark accretion disc intersects the outflow wind structures (Elvis surfaces) whose fluorescence above and below the plane (blue) contributes to the UV-optical continuum observed. The compact radio core (red) is shown in size and distance scaled to the overall structure.”<sup>5</sup>

(Image: Christine Pulliam/CfA)

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