

Light Speed

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Summary

Light's vacuum speed is known; the real reason for it is not. Light speed is critical for much of physics, both Relativity and quantum theories. A new understanding will refresh physics in the remaining 21st century.

Other related topics in this essay include (1) photons and the Big Bang; (2) Yin/Yang matter/energy units; (3) relativity to what; (4) Zeno of Elea's paradoxes; (5) QM and QFT; (6) logarithmic size dimensions; (7) strings and quantum foam; (8) second law of thermodynamics; (9) magnetic and electrical monopoles; (10) primary and secondary EM; (11) evolution of push/shadow gravity theory; and (12) GPS.

Framing the discussion

It is not sufficient to measure the speed of light in a vacuum, and stop there. We need to know *why* this speed is always exactly what it is, and why the vacuum terminal speed is the same everywhere. When we learn this reason we will open another door into the universe.

The speed of light in a vacuum has been precisely measured. It is 299,792,458 meters per second.¹ From this speed we can get the precise definition of a meter, of Planck time, and of Planck frequency.² Dimensions smaller than 10^{-35} meters should exist, but we cannot classically probe them with photons, so current theory says we need to employ quantum physics. When light goes through other media it slows down. It can be spectrally

¹ https://en.wikipedia.org/wiki/Speed_of_light

² https://en.wikipedia.org/wiki/Planck_time

decoded according to different wave lengths, as Newton discovered with his prism.³

Again, just knowing the precise speed limit of light in a vacuum does not say anything about how and why it travels at that maximum speed in the first place. This gap in our basic knowledge is conceptually dangerous, because General Relativity cosmology relies on a singular universal speed limit to explain the shape of its architecture.

Consider that the letter "c" is nothing special by itself. It has become the commonly accepted algebraic term for the terminal vacuum speed of light. The letter "c" is frequently found in English, and is part of many formulas and terms, such as Einstein's famous $E=mc^2$. In Relativity cosmology "c" alone is generally reserved for this so-called universal speed limit. Both Einstein's Special Relativity (SR) and his General Relativity (GR) depend on the idea of a universal speed limit for light speed and for spacetime.

— Here is the post-Big-Bang motion picture —

Before there were photons, electrons and other particles in our earliest local universe, there was a very brief period of nearly pure energy "inflation" just after the primordial, bounce-back Big Bang itself. Energy shot out at hyperluminal speeds from the small near-singularity,⁴ only to cool down to the speed of "c" when the greater-mass Yin/Yang particles appeared, which were not yet photons. Photons emerged when strings of Y/Y particles cohesively formed. Quarks and then protons soon followed in what are known as the Quark Epoch and then the Hadron Epoch. That was the transition from nearly pure energy to a conserving balance of energy and matter, symbolized by the oriental Yin/Yang icon.

In other words, the "Yang energy" in Yin/Yang nearly replaced the "Yin matter" component at maximum compression. At that point there was a quantum push-back from the residual matter, fueled by the concentrated core energy, and the result is natural history. If Yang had nearly been totally victorious at the exact moment of the primordial Bang, the brief period of Inflation could have produced a nearly infinite expansion of the universe absurdly similar to Newton's second law as expressed by $F=ma$.

³ <https://en.wikipedia.org/wiki/Prism>

⁴ <http://astronomy-links.net/InsideBlackHoles.html>

There were approximately 380,000 “Earth years” from the actual Big Bang moment to when the emerging energy/matter foam cooled enough for trapped photons to visibly appear from within the primal fog through photon decoupling. At that time photons decoupled from other interfering matter such as random electrons, and were free to fly without being locally scattered. We can now see from Earth up to that last scattering surface in the Cosmic Microwave Background (CMB).⁵

Therefore, we can only see from Earth almost 13.8 Bly, which is the visible radius of our “visible universe.” If we could now somehow *instantly* be transported in a *magical* spaceship to almost 13.8 Bly away, we could not yet see outward from Earth’s direction an additional distance beyond, because there would be no free photons from the other side to see. We would need to continue instantly outward inside our magical starship to the distal side of the obscuring CMB sphere, and beyond the new inflationary boundary. From there we would witness electromagnetic energy coming at us from universes beyond. All of this journey happens in 4D.

Just because we cannot at any given time and place see something, does not prove that it does not exist. The total diameter of our universe could be 93 Bly, or thereabouts, following a brief hyperluminal energy expansion after the near-singularity began to rebound.

Quoting Wikipedia:⁶ “The best estimate (as of 2015) of the age of the universe is 13.799 ± 0.021 billion years, but due to the expansion of space humans are observing objects that were originally much closer but are now considerably farther away (as defined in terms of cosmological proper distance, which is equal to the comoving distance at the present time) than a static 13.8 billion light-years distance. It is estimated that the diameter of the observable universe is about 28.5 gigaparsecs (93 billion light-years, 8.8×10^{23} kilometers, or 5.5×10^{23} miles), putting the edge of the observable universe at about 46.5 billion light-years away.”

— Relative to what? —

Ideas of relativity within SR and GR are critical to understanding both paradigms. We are already familiar with family relatives, such as cousins and uncles. We also think about relative 3D spaces, measured by units such as meters. There is relative time such as yesterday, today, and tomorrow.

⁵ [https://en.wikipedia.org/wiki/Recombination_\(cosmology\)](https://en.wikipedia.org/wiki/Recombination_(cosmology))

⁶ https://en.wikipedia.org/wiki/Observable_universe

The list of everyday relative examples within our common existential frame of reference is extensive.

The key behind all types of relativity is *relative to what*. One of the first philosophers to tackle this deceptively deep question was the ancient Greek, Zeno of Elea, a student of Parmenides. Zeno's *paradox of the arrow*⁷ is still fascinating, as he shows that an arrow in flight is both moving and not moving. We can say the same about any quantum phenomenon in our world that appears to be moving, or not moving when observed.

Observational and experimental science is having a hard time being truly perspective-independent. Quantum mechanics (QM) and quantum field theory (QFT) involve *waves that are moving until they are instantaneously observed as objects*. There is an emerging area of quantum science called the *Quantum Zeno Effect* that seemingly freezes a quantum wave state, neutralizing the Heisenberg measurement effect⁸ through rapid observations within wave phases.⁹ There is also a recent Chinese experiment that claims to have achieved a "counterfactual quantum communication" with waves, not particles. However, the speed of that communication still is at the particulate-related photon speed.¹⁰

Short of infinity and infinitude we invoke moving frames of reference. A 4D frame of reference is a 3D place in a local time. Movement gives 3D the fourth dimension, making 4D. The general idea is that one vector frame can operate as our theoretical standard by which other frames are measured. However, all frames are *ad hoc*, equal, and not hierarchical in importance. My frame of reference and yours are equally valid within each of our frame's time and place. A physics frame of reference need not be anthropocentric or terrestrial. It applies anywhere anything is potentially measured against another.

In Special and General Relativities frames are defined by the universal speed limit of light. Time slows toward a halt, as speed approaches "c," seen from outside a photon's vector inertial frame. This is called the relativistic effect. It is generally not significant below 10% of "c," which means most

⁷ https://en.wikipedia.org/wiki/Zeno_of_Elea

⁸ https://en.wikipedia.org/wiki/Uncertainty_principle

⁹ https://en.wikipedia.org/wiki/Quantum_Zeno_effect

¹⁰ <http://www.sciencealert.com/scientists-have-achieved-direct-counterfactual-quantum-communication-for-the-first-time>

physical calculations can use the math of Newton, not Einstein. The idea of sloped space is simple enough to understand, but becomes more difficult when we see that *it takes an infinite energy to instantly accelerate any mass* to any terminal speed, including "c," which is why acceleration is a timed slope, not a vertical wall.

In theory, nearly pure energy with nearly zero mass, not just that released by the primordial Big Bang, has the capacity to travel at very hyperluminal speeds. Information itself, in the form of energy waves, could travel faster than "c," and this hyperluminal possibility forms a basis for much of today's quantum field information theory. It also underlies Einstein's skeptical spooky action at a distance. However, pure energy is not what we can experience, because the time of acceleration is not zero. Because there is some inertial mass, electromagnetic (EM) information cannot exceed "c." Any coherent pure energy could travel too fast to apparently fit into our photonic time frame.

Size dimensions

An understanding of how amazing the vacuum speed limit of "c" is within our existential and intellectual world views requires an appreciation of the truly amazing *logarithmic scale* of size dimensions. Experimental machinery using photons fails to come anywhere near measuring the level of the real fundamental Yin/Yang particles.

It is assumed that anything smaller than the Planck limit of 10^{-35} m is purely quantum and possibly random. Strange quantum ideas have thus appeared, including formulas that *correlate* with measured emergent reality, *while not causally explaining* any of it.¹¹ In comparison, GR gravity does away with tiny quantum units, reducing otherwise granular gravity to sloping membrane geometry. GR doesn't work well in the sub-Planck dimensions. It is time to replace these incongruent theories a hundred or more years old with a more viable, emerging 21st century physics, the modernization of which moves us closer to a coherent theory of everything (TOE).

Our primate body size and the prehistoric proximate environments within which we have evolved is in the 10^{-1} to 10^2 meters range. Our current telescopically perceivable world ranges outward toward the limits of our local visible universe around 10^{26} m.

¹¹ <http://astronomy-links.net/correlation.and.causation.pdf>

In the opposite, downward direction from our body's outward scale are the dynamic building blocks where everything happens, and ultimately all things great and small emerge, even the vast universe of universes. In other words, the smallest units create and define the largest.

The naked eye can hardly perceive anything smaller than one-tenth of a millimeter. Modern electron microscopes can now image down to the scale of atomic nuclei, or 10^{-15} m. However, even atomic nuclei, including their assumed fundamental components the quarks, are dimensionally huge and complex relative to their ultimate components. There is more complexity per unit volume within our individual bodies than anywhere in visible outer space. Dimensionally, there is as much difference between a solar neutrino (at 10^{-24} m) and a human – as there is between a human and the Virgo supercluster.¹² Even a tiny solar neutrino is huge compared to the truly elemental building blocks, the Yin/Yang particles at approximately 10^{-37} m.

There is no way we can build a photon microscope that can directly image solar neutrinos that are nine logarithmic dimensions smaller than protons. There is indeed no way to directly image Y/Y particles that are twenty-two dimensions smaller than protons.

However, there are ways in physics to measure what emergent collections of Y/Y particles do within our human dimensions.

We cannot experimentally vision individual Y/Y matter/energy units, but we can logically *envision* them. If we cannot, or will not, envision this fundamental level (other than with chaotic quantum theory math) we might as well be building our random math castles without basements.¹³

How "c" becomes "c"

The vacuum speed of light is a given, but its speed limit has nothing to do with universal laws. For physics to advance, and for theories to unify, we need to understand what is going on with the actual birth of each photon.

All light ends up at the terminal velocity of "c" in a vacuum relative to its initial frame of reference *after a period of acceleration*. If an observer were to *magically* leave the shared initial photonic frame, traveling parallel with

¹² <https://www.quora.com/How-big-is-a-human-relative-to-the-size-of-the-known-universe>

¹³ <http://astronomy-links.net/AstrophysicsCloudCastles.pdf>

any new photon, accelerating at the same rate and time, the photon would always appear to be stationary. From the photon and observer's shared velocity frame of reference the observer would also appear stationary. It is only when we compare the velocity frames of a photon relative to its frame of origin do we get relativistic "c." Here is how it works:

String theory modifies GR to include an obscene number of possible universes, and many dimensions. Mathematically, things can appear elegant, even if unprovable and absurd. We can do better.

The idea of strings does have value, but not as $2D^{14}$ sub-Planck units, including the bogus idea of gravitons going from brane (membrane) to brane, exerting *tractor-beam attractive force* across up to ten dimensions. Clever algebra equations appeal to the Sheldon Coopers of physics, but are ultimately meaningless by themselves, however elegant. Meaningful is the growing amount of observational evidence against the idea of rubber-sheet, tractor-beam gravity.

At the very bottom of it all are matter/energy units (which could be loosely described as quanta that aren't chaotic). These are the Yin/Yang particles (or fundamental units, or quanta). They can express either matter, or energy, or both. Importantly, they join together in 3D bead-chain-like strings, and in other spherical formations within our 4D universe, quite unlike what clever superstring M-theory¹⁵ envisions.

It is facile to assume that I am describing "quantum foam" in another way.¹⁶ Even though a vast sea of Y/Y particles and Y/Y gravitons may in some ways seem similar to quantum foam, there are critical differences:

The idea of quantum foam in quantum theory invites the second law of thermodynamics.¹⁷ In theory, quanta both go into existence and go out. Each one could be like an extremely tiny Schrödinger's cat. Unlike cats, quantum foam quanta are like the much larger gas atoms or molecules in a closed system. The universal system of quantum foam is indeed like the laboratory closed system that only moves from negentropy (order) to entropy (disorder). There is no guiding hand, other than a possible eternal

¹⁴ <http://astronomy-links.net/2Dis3D.pdf>

¹⁵ <https://en.wikipedia.org/wiki/M-theory>

¹⁶ <http://astronomy-links.net/LIGO.and.GR.pdf>

¹⁷ https://en.wikipedia.org/wiki/Second_law_of_thermodynamics

and omnipotent god, that can reverse the eventual quantum foam drift to entropy. We need a higher order new physics to universally embrace and defeat the so-called inevitable second law of thermodynamics – and that’s just what the ecosystem of dialectical Y/Y particles embodies.

Then there is the quest to capture and define magnetic monopoles.¹⁸ In electromagnetism (EM) there are many electrical monopoles (such as positive protons, and negative electrons), but no naturally authentic magnetic monopoles discovered so far. In EM theory there should be equal amounts of electrical and magnetic monopoles. A possible break in this mystery is the recent creation of *quantum monopoles*, which are virtually point sized, not atom sized. This quantum idea approaches, but does not equal, the idea of fundamental Y/Y particles.

Gravity itself does not require mystical ether concepts to work.¹⁹ There was a poorly developed version of push/shadow gravity that Nicolas Fatio advanced in the late 17th century. He was for three years a close friend of Isaac Newton, until Newton veered off into his alchemy. In the mid 18th century Le Sage in Switzerland developed a push/shadow version of Fatio’s model that was popular until the late 19th century. The fatal flaw in Fatio and Le Sage’s gravity model was their idea of swarms of extremely tiny, hyperluminal billiard-ball impactors which, as was critically observed, would vaporize impacted ordinary matter.^{20,21,22} That flaw left a conceptual void in gravity theories that Einstein was happy to fill.

Within the past few years I have seriously revised and restored push/shadow gravity to where it is now reliably superior to GR gravity.^{23,24} Plus, the other primary forces have been refined to primary and secondary electromagnetism. All three primary forces interrelate and interface within all dimensions (starting with combinations of Yin/Yang particles, out to the multiverse), which is needed for any successful Theory of Everything (TOE).

¹⁸ <http://www.sciencealert.com/our-quest-to-find-the-truest-north-in-the-universe-just-took-an-unexpected-turn?perpetual=yes&limitstart=1>

¹⁹ <http://astronomy-links.net/ethers.html>

²⁰ https://en.wikipedia.org/wiki/Le_Sage%27s_theory_of_gravitation

²¹ <http://astronomy-links.net/GGvsGR.html>

²² <http://astronomy-links.net/Gravities,BlackHoles,BigBangs.pdf>

²³ <http://astronomy-links.net/TestingGravities.html>

²⁴ <http://astronomy-links.net/DipoleRepellerExplained.pdf>

The ancient Greek atomists obviously could not literally see atoms, having nothing like an electron microscope, but they could envision them with *deductive logic*. Nobody can see individual Y/Y particles, but their collective and emergent actions and iterations can be seen and measured with *inductive logic*. It is not enough to have vector theories that correlate with the truth; they need to model the actual truth. Some Greeks had the correct idea of a smallest and fundamental particle. They just couldn't yet imagine how small the true atoms, Y/Y particles, are. What we today call atoms are critical building blocks of our meta-dimensions, but they are not true atoms in the original sense.²⁵

So now we go down in our minds to the smallest physical realms, smaller even than 10^{-35} meters. In pure theory there is no mathematical limit to how small negative exponent dimensions could be, short of zero – just as there is no purely mathematical limit to the time that Zeno's Achilles could fractionally chase his turtle.²⁶ In a practical sense, nothing smaller than about 10^{-40} meters makes sense materially and energetically. At that level we still have the unity of opposites in matter-and-energy Y/Y units.²⁷

According to Coulombic inverse relationship electrical attraction, the mathematics of which seems similar to Newton's inverse relationship gravity, force is measured from point to point. Newton uses gravitational force measured from the point center of masses. We could say that Y/Y particles are both spherical and point-like in their diameters.

Quantum field theory does not describe quanta as tiny spheres, but as resonant aspects of more fundamental waves, which can sometimes be seen as points when measured. In contrast, I envision Y/Y particles as much more stable, almost in a classical way, while still being able to switch between energy and matter in different degrees as required by their non-random combinations and interactions. EM strings of such particles spin like marching band batons while they travel, creating what we see as waves. All EM units conserve energy and matter.

What do Yin/Yang "strings" look like? If you were to imagine looking at a 3D string of pop beads similar to what kids play with, and step away a sufficient distance, each bead string of sufficient length would seem like a

²⁵ <http://astronomy-links.net/SeeingUnseeable.html>

²⁶ <http://platonicealms.com/encyclopedia/zenos-paradox-of-the-tortoise-and-achilles>

²⁷ <http://astronomy-links.net/BlackDark.html>

pure line without beads. Perception or not, real strings are “beads” held together with *primary* Coulombic electromagnetism, a force that is neither polar, nor monopolar. Bead strings can express *secondary EM* polarity at their ends, giving a +/- electrical charge. Or, they can simply exist and persist as neutral photons without electrical polarity.

These beads can also form loops (shades of loop quantum theory), which I call *gravitons* (totally unlike how String Theory conceives of them). Free floating Y/Y gravitons constitute a portion of push/shadow gravity, and of dark matter collections. There is nothing inter-membrane, tractor-beamish about real gravitons.

Understand that at no time are we talking about any form of discredited hyperluminal billiard balls when we are describing push/shadow gravity. The impactor units range from individual Y/Y particles, to spinning strings of them, to gravitons and other cohesions. As one of these “gravity units” interfaces with other objects through the push/shadow relationship, there is a transfer between kinetic energy and potential energy.

Gravitational energy/mass can be transferred from the more massive impacted to the impacting in the form of higher frequencies – or emitted as additional energy/mass units not directly involving the impactor – thus avoiding push-gravity overheating of the impacted, which was the lethal flaw in early push/shadow theory.

This energy transfer *directly* occurs when impacting units break off previously attached strings of Y/Y particles from the impacted. This breaking is accomplished *indirectly* by stimulating higher vibrational frequencies of gravitons within the impacted, which in turn spin off new bead strings, conserving energy/matter within the impacted. Kinetic energy becomes potential as the impactors lose kinetic energy (gaining mass/potential energy) in slowing down, and yet remain Yin/Yang particles. These processes all work like a heat sink.

The direction of energy transfer has been envisioned as from graviton or Y/Y particle impactors to impacted mass. However, there is no absolutely preferred frame of reference. Therefore, from the so-called impacted object’s frame of reference it could be seen as moving toward the so-called impactor, with resultant energy transfer in the other direction. Given both frames at the same time, neither frame is primary, and energy can and does flow between both objects – even creating new objects, some of which join dark matter. This is another mechanism where acceleration and gravity can be seen as the same force.

There is nothing special about launching a proton in a *linear accelerator* to a target within the accelerator. The accelerator staff's third perspective is just another frame of reference at the moment of impact. At any zero time in two compared frames both objects are at rest and in motion as Zeno explained, and as in Newton's first law. Einstein's elevator metaphor also helps explain how gravity and acceleration at non-Relativistic speeds are virtually equivalent.

Comparing relative fields of time between a burst of linear acceleration and its target involves a velocity acceleration field over a period of time as recorded by the site of launching. This clearly explains why it takes massive energies to launch protons to nearly light speed. It would take infinite energy to instantly launch any amount of energy/mass, even a single proton, to a distant target, as seen from the accelerator gun's frame of reference. After a hit occurs, sensors record what has happened for the accelerator staff. This record is possible because both accelerator gun and sensors share a common field of reference with the accelerator's staff.

Gravitational push units from the multiverse can be interactively slowed down sufficiently to leave any natural or intentional target, and become part of the local dark matter gravity field.^{28,29} Here is a source and nature of much stable, local Dark Matter.

Primary beads can also form larger balls of Y/Y particles, cohesively joined through primary EM. Imagine a fuzzy ball, with attached strings forming the fuzz. Put together enough cohesive Y/Y balls, and you have protons and neutrons. The difference between protons and neutrons is the polarity of Y/Y strings attached to and sticking out from each larger "atomic" structure.

There is hardly any limit to the dimensional size of interactive structures constructed with Y/Y particles. For example, human bodies are very sophisticated dialectical combinations of Y/Y structures. So too is the Milky Way. All things in all dimensions are held together and transformed through gravity, primary EM, and secondary EM. You would expect this symphony from any successful TOE.

²⁸ <http://astronomy-links.net/Evidence.for.Multiverse.pdf>

²⁹ <http://astronomy-links.net/Universe.universes.pdf>

– How and why “c” exists –

Photons are strings of Y/Y particles. A single Y/Y particle is not a photon, as spinning strings of Y/Y particles are needed to make frequency waves. All photons have some mass, which we now know, but previously didn't. The mass of a photon is very low, but not zero.

Think of the graviton as a ring-like collection of Y/Y particles. Gravitons are at least two logarithmic dimensions larger than individual Y/Y particles, but still at or below the arbitrary Planck level. Attached to each graviton's cohesively joined Y/Y particles are flexible strings of potential photons. Singular primary EM attachment of the proximal Y/Y particle of each string to its anchor ring is exactly half as strong as the attachment of each pair of its graviton's Y/Y particles to each other.

In other words, the string has one terminal particle attached to its ring; whereas each Y/Y particle in the ring is attached to two other equally attractive particles. The significance here is that photon strings can come and go, but the rings or collective balls remain intact.

When energy impacts a graviton, or collective ball of Y/Y particles, or even a potential photon string itself, there can be released an actual photon, or at least one Y/Y particle. The length of each released spinning string determines its wave frequency, with additional characteristics such as color. Centrifugal force ensures that each free and spinning string remains straight.

Longer EM waves (nm) have lower frequency (Hz) and lower energy (eV) than short waves. There is relative weakness of long radio waves versus the great power of X-rays with their very short wave lengths. Each of these energy wave frequencies describes different Y/Y string-particle lengths.^{30,31}

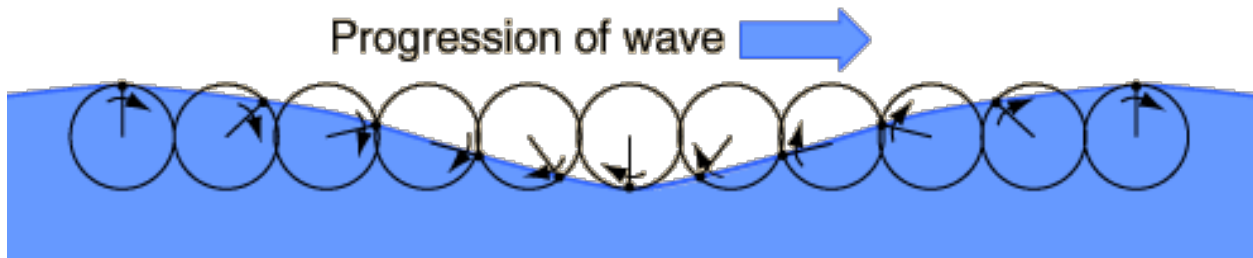
EM is characterized by waves, which are primary in Quantum field theory (QFT). You can also describe a measured wave as particulate, which is how Einstein got his Nobel. The explanation for this unity within duality is simple:

Think of strings of Y/Y particles spinning around like marching band batons, which they do as they are ejected from their anchor. Newton's first law indicates there is no reason for this spinning once started to slow down

³⁰ <http://www.wordwizz.com/pages/scales.htm>

³¹ [https://en.wikipedia.org/wiki/Orders_of_magnitude_\(energy\)](https://en.wikipedia.org/wiki/Orders_of_magnitude_(energy))

unless interfered with by an external force. When a slit experiment is performed you can get both points and waves, depending on the polarity of the slit, but this is easily explained. Rotating and moving "baton" lengths may appear to us as waves, as shown by this following diagram:³²



When a photon string of Y/Y particles goes through a polarity slit you will either see it as a wave, or as a point, depending on the polarity of both the slit and the photon string when measured. You will get a point if you measure either point-like end of the spinning straight string as it passes through end-to-end. Wave or point is simply an artifact of measurement.

— **Now we get to the actual "c" speed³³** —

Einstein's general $E=mc^2$ formula expresses the equivalency of energy and matter, which is exactly what individual and aggregated Y/Y particles express. The universe of universes itself also reveals the duality of energy and matter, which expresses as the simultaneity of cause and effect. This dualistic simultaneity was already known in Indian antiquity, and it is the essence of the Buddhist *Lotus Sutra*.

The $E=mc^2$ formula *implies* acceleration between two frames of reference. It is an update from Newton's Force=(mass)(acceleration), or $F=ma$. Each photon starts from something somewhere, and then it makes its way to wherever. There is always a very brief moment of acceleration, followed by a potentially long time of coasting at light speed, like a bullet leaving a gun.

I would like to make the implied obvious, by clarifying Einstein's seminal formula as follows:

$$E=mc^2/\text{Time of acceleration, or } E=mc^2/T$$

³² <http://hydrogen.physik.uni-wuppertal.de/hyperphysics/hyperphysics/hbase/waves/watwav2.html>

³³ <http://astronomy-links.net/timearrow.html>

In $E=mc^2$, he has $T=1$ "photon acceleration to terminal velocity time unit." There is no need to add an implied T as the one-unit denominator, and so back to $E=mc^2$.

We know that photons accelerate very quickly, and we also know that any mass at all, however small, accelerated to terminal velocity over a zero period of time would need to have been launched with infinite energy, which is absurd in the real world. Thus the positive, non-zero time acceleration of photonic "T."

Using $E=mc^2$, if mass is zero, then E is zero, whatever the value of "c." You cannot accelerate a zero mass in zero time, which Newton's $F=ma$ second law confirms. Therefore, there is always some mass during acceleration, which is implied within the Yin/Yang symbol. Otherwise, "c" would be infinite, even with infinitesimal force, which is absurd.

Although unstressed Y/Y particles are spherical and identical in mass (with spheres being Nature's most efficient shape), they are also somewhat elastic when their juxtaposed string is stressed at their dimension.³⁴ When stretched, the round particle shape starts to look more like a chicken egg. If an impact or increased vibration frequency is insufficient to break the string's primary EM bond to its anchor graviton, or within itself, there is no photon generated.

On the other hand, there will be equal shape stretching among the units composing a beaded string – before the centrifugal force of a spinning graviton, or spinning Y/Y collective sphere, exceeds the cohesive attachment of each string's proximal Y/Y particle to its graviton base's proximal Y/Y particle.

Here's the beauty: *The attached Y/Y particle string experiences all of its spherical units stretching into more egg-like shapes as the energized host graviton base increasingly vibrates, and while the primary EM force still holds. Immediately after the string's base pops free, the entire chain shrinks back to its original length in a rapid sequential succession, from proximal to distal, in the unit time of "T" and at the speed of "c." Elongated shapes return to their natural spherical shapes, thus shortening the string to its original length. The result of this linear cascade is the new spinning photonic string being launched at exactly "c."*

³⁴ <http://astronomy-links.net/Quasars.and.Mini-Quasars.pdf>

It doesn't matter if the photonic string is short (such as with X-rays), or long – because the *cascade of shrinkage is determined by each juxtaposed and equal individual unit in a string snapping back to the preferred sphere – and all of this ends up at exactly terminal "c" light speed. The speed of this happening is not dependent on the number of Y/Y particles in a string, as they are all equal and directly touching. The frequency type of photon is determined by its string length, but not its initial speed.*

They all snap together at the same speed as one snaps. There is "T" time involved, because there is mass/matter in Y/Y particles. The "T" time is the same for all in the string as for one particle, which keeps our version of this formula simple. (Imagine each escaping string as being like a rubber band that we stretch with our fingers and "shoot." Out it shoots, and spins.)

Although directly invisible to our instruments, this photon birthing process is a very beautiful phenomenon with elegant consistency that fooled Einstein into imagining here is some sort of universal speed limit. Throw in some basic confusion about relative frames of reference, and you have SR and GR.

GPS

Today's best defense of Relativity falls back on the reliability of GPS. Yes, GPS math does track what is really going on – but what is going on is not Einsteinian Relativity. GR is correlation without causation.

The major problem with General Relativity (GR) is its obvious failure to explain gravity on very large scales. The most recent absurd use of this idea has to do with the so-called Dipole Repeller.³⁵ Even the LIGO experiment did not fully justify GR, even though the dual sensors did detect primary-particle field waves emanating from the merger of two black holes.³⁶ In both of these cases an alternative explanation is superior.

For GR to be accepted as a universal model, rather than something that just gets verifiably used above our atmosphere, it needs to be verified in all size dimensions above the Planck scale. The alternative 21st century version of push/shadow gravity works in all such 4D dimensions.

³⁵ <http://astronomy-links.net/DipoleRepellerExplained.pdf>

³⁶ <http://astronomy-links.net/LIGO.and.GR.pdf>

Briefly, there are apparent clock differences between GPS receivers anywhere on the ground and GPS satellites. Unless corrected, those clock differences would quickly lead to major positional errors. It has been found that by only using Special Relativity (SR), the satellites appear slightly slower. On the other hand, the simultaneous GR effect is about twice as strong *in the opposite direction* as the SR effect. To correct for this dualistic problem, and to produce extreme correlative accuracy on the ground, quartz clock crystals within sending and/or receiving equipment can be installed with slightly different vibrational frequencies.³⁷

Correlating GR says the clock on the satellite is speeded up relative to our terrestrial position, because it is not as deep in Earth's spacetime gravity well, or membrane gravity cone. Alternatively, from the causative push/shadow perspective we are shaded more at the surface than in nearby space, not deeper in Earth's mystical gravity well. The extra partial shade from Earth's mass slightly reduces the omnidirectional multiverse push particulate flow coming from Earth's direction toward the satellite – allowing photons coming to us from satellites to travel slightly faster toward us on their journey, since they are encountering slightly less push resistance. This is also an elegant example of Newton's third law.³⁸

There is no need to invoke universal speed limits, or ethereal branes and membranes to explain our GPS systems. No need for physics-class rubber sheets. It all starts with the incipient terminal "c" speed at a photon's launch, which is the same whether the photon leaves a moving satellite, or from somewhere on Earth's moving surface. Whatever happens to the photon thereafter determines the GPS clock problem.

Push/shadow gravity is primarily a phenomenon of multiverse Y/Y particles, photonic Y/Y strings, gravitons, Y/Y collections spherical or otherwise. It also involves various speeds and forces, none of which are hyperluminal. Looking at all of the many variabilities in vast time and space, we must return to the simple phenomenon of Y/Y particles stretching and shooting away from their base, reaching the same "c" terminal velocity.

Microcosms dialectically create macrocosms, when seen through the Yin/Yang unity of matter and energy, with simultaneity of cause and effect. All is

³⁷ <https://www.quora.com/Does-a-GPS-have-a-different-time-due-to-the-speed-it-has-relative-to-the-Earth-What-has-to-be-corrected>

³⁸ <http://hyperphysics.phy-astr.gsu.edu/hbase/Newt.html>

scientific reality with mystical beauty beyond our powers of vision, but not beyond our power to envision.

