

# How Large is Our Universe?

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## Abstract

Our local universe can be confused with its visible universe. The visible region of our local universe is somewhat smaller than its extended region, mostly because of the pre-photonic, hyperluminal moment at the very beginning of our local big bang. This essay examines the relative role of light speed versus sketchy 2D concepts of stringy spacetime that question fourth-dimensional time itself. The 4D multiverse is modeled, and hyperluminality's key role concludes this discussion – along with the causative differences between common black-hole formation, and formation of rare big bangs.

When we hominid apes gazed with naked eyes at the sky over the most recent million years we saw a few bright stars, typically out to about 2,500 light years. A few fuzzy, naked-eye objects such as the Andromeda galaxy are truly distant, but our eyes couldn't tell how distant. M31 is about 2.5 million light years away, still a close neighbor from the full multiversal perspective.

When Einstein was developing his General Relativity model of what he thought is the universe, the Andromeda galaxy was thought to be just another "spiral nebula" within the local Milky

Way. [If Einstein had known about the full 4D cosmic picture](#), he might (or might not) have developed a very different spacetime general relativity.

[Read this NASA link](#) that chronologically shows how our ideas of the visible universe have expanded with increasingly superior technology, long after Einstein's General Relativity (GR) appeared. Here is [another valuable source in questions/answers format](#).

Considering the "cosmic zoo" that experimental astronomy with superior instruments has revealed within the last century, it is time to frame his quaint correlating model of GR and spacetime as analogous to physics-class rubber sheets. As long as popular theoretical physics sticks like a tick to his simplistic cosmological paradigm, theory cannot properly model such critical ideas as dark matter, dark energy, and multiversal gravity itself – not to mention [what goes on inside black-hole event horizons and their cores](#). Emerging modern cosmology is much more exciting than reverse-correlating narrow data with the wrong causal model.

## Visible Versus Invisible

There are two aspects of why only some of the potentially visible portion of our local universe is visible to our instruments; and not the invisible local universe, much less details of the embracing 4D multiverse:

First is the apparent phenomenon of the *Hubble Expansion* that was only correlated by the Hubble telescope a few years ago. Popular theory assumes that a mysterious *Dark Energy* provides the expansion force, which enables us to see post-Big Bang (BB) areas larger than we otherwise should. This model is an error in cosmological understanding, but it does sufficiently correlate with measurable data to have been workable and specious.

A better correlation would be the *mutual push/shadow effects that juxtaposed universal masses have on each other*. Popular

ideas of dark energy assume that this mysterious and unproven energy has grown over the past four billion years, in a virtually spherical manner. [Recent data is noticing irregularities in the speed of expansion of our galactic boundaries](#), as registered in the cosmic microwave background. This is important.

Old ideas of dark energy don't work here. However, the more elegant model of inter-universal push/shadow gravity does track perfectly with the very likely reality of juxtaposed discrete universal masses. Without extra-universal homogeneity, differing net attractive effects on our universal bubble are indicated. New data points to the antique idea of our dark energy pushing smoothly outward as existentially very wrong. [Read this link for more of what really orchestrates the Hubble Expansion](#).

Second is the new physics that underlies what we can and cannot see of our local universe. That new perspective involves the essence of hyperluminality concurrent with our BB birth. What we will learn in this essay clarifies several phenomena on an astrophysical scale, while still linking the very smallest with the largest phenomena. This new perspective will help theorists build a viable theory of everything (TOE) on all scales.

## **Big Bangs**

The real 4D multiverse can be elegantly modeled as somewhat like a "bubble bath," with "local-bubble universes" emerging, then dissipating after trillions of years. Juxtaposed energy and matter continuously infills any local universal voids. There is so much real time wrapped up in the full multiverse that it can seem to us like the multiverse is timeless, or is Time itself.

It is logically absurd to say that energy in physics comes from [pure 2D nothing framed as a hologram](#). The metaphysical idea of a local-universe's 4D "god" also cannot be fully eliminated, nor can it be logically or experimentally verified. Mystical forces

anywhere in cosmic math equations make all adjusted math models possible; and all equations thereby become absurd.

Accompanying the forever unverifiable idea of a multiversally singular god just for our individual selves on this one planet is the vanity question of how much that deity “loves” us individual humans among the almost eight billions of us now on this one planet. Factor in many billions of stars in the Milky Way, among many billions of galaxies in our known universe, and among who knows how many local visible universes there are in the vast 4D multiverse. Finally, consider the multiplication factor of all the highly sentient species coming and going over billions of years on each populated planet. *Perhaps we are only as special as we can make our lives to be on our own planet*, which should be enough.

We sentient humans are verifiably here, and possibly rare. However, our singular numerator is exceptionally small over the exceptionally large cosmic denominator of all other possible advanced life forms. What’s stopping other species from being divinely loved (or having been loved while they existed) just as much by one or more gods? Infinitesimal is not yet zero, so there is always mystical hope as long as there is at least one possible additional species in the divine-love numerator. Still, our one is enough, because our essential worth does not depend on others.

The most popular metaphysical model involves eternal and omnipresent divinity beyond space and time. It’s going to take more details to comprehend what it would qualitatively mean for God to tautologically say to Moses, “I am that I am.” An archaic anthropophilic local god creation model is not logically self-extinguishing. It is purely agnostic, given our verification limits. *Anthropophilic theism* is not the most elegant science idea, and it hardly is supported by experimental physics from any historical frame of reference. *Infinite regression* beyond time is also a very awkward challenge for any idea of verifiable universal origins.

The Vatican has moved on from sanctioning burning at the stake dissonant cosmologists [Giordano Bruno, 1600, in Rome],

to building a nice classical [observatory](#) last century in Arizona. The papacy thinks of our local big bang as singular, initiated by the intentional loving creator. Their remote and fairly large optical observatory is a modern version of large cathedrals that were built to attract medieval paying customers to mass, and to emphasize the partnerships among bishops and secular kings.

The birth of Jesus was THE “religious big bang” for the Roman Catholic Church. Subsequent expansion of Christendom within the Roman Empire led to the expansion of Christians throughout the world. It should also be noted that this expansion analogy is limited to the exploitable Earth biosphere as originally understood in Bronze Age *Genesis*.

Until after Copernicus and Galileo, all life began and ended here, with our jealous tribal god dangling the heavens over us all. Interestingly, Bruno’s idea of many nearby celestial suns and their many nearby inhabited exoplanets fits neatly into a larger version of this Vatican model as part of the ongoing expansion of local life. Here is metaphysics trying to embrace physics on a grand local-universe scale, but not yet the grandest.

In contrast, the idea of our local visible universe being just another universe among countless others in the 4D multiverse is alien to the local one-Jesus story. In versions of the metaphysical multiverse God is very busy with other evolved life forms. Maybe there are multiple Jesus sons, or something similar. With irony, this “loving” God also has witnessed many species’ extinctions.

Twentieth-century models of our uniquely expanding singular universe, with hyperluminal and dark-energy elements, are only a partial physics. There are many astrophysics questions that only an elegant 4D multiverse can embrace without math that Kurt Gödel would love to dissect. Statistically irrelevant populations sitting as *numerators* atop their round rock inside an expanding *denominator* of space and time, cannot perceive what else may be. With kindness, we all want to be essentially and existentially relevant now and forever, and be happy on our rock.

An argument could be made that God does not lie to his/her “chosen” people, despite what happened to the Jews in WWII. That reasoning only has so much traction. The most common excuse for the persecution of innocent people is to *blame the victims for not being holy enough*. This specious argument has several iterations in the *Old Testament*, such as the story of Sodom and Gomorrah, and the justifications for God’s chosen people being conquered and banished to Babylon.

Even bad faith acts in the Garden of Eden are put forth as reasons for God’s punishment of all their descendants. With *Original Sin* preceding us all in the modern world, what hope other than pure divine grace do we have? Since the Garden is supposed to take place a few days after our local big bang, this could mean that God was just being jealous in a tribal way, or distracted by other big bangs and space love elsewhere.

Messy Bronze Age theology does not mesh well with physics after the 20th century arrived. Along came Einstein’s General Relativity spacetime during WWI. Decades later bogus 2D string universes proposed (in M-Theory)  $10^{500}$  discrete local entire universes – where every goofy thing imaginable could find a home, including even perfect heavens for imperfect Earth sinners. (By comparison, the estimated total number of hydrogen atoms in our visible universe is “only” about  $10^{70}$ .) Why  $10^{500}$ ? That’s where the stringy math equations satisfy themselves.

The late and slippery Stephen Hawking, and now the three winners of the 2022 Nobel Prize in physics, have all done their best to promote their sexy psychedelic paradigms. Again, I have written on their dimensional absurdities multiple times, with few academic readers, and no promotion of the truth over Vegas hype. ([Read my clear essay written in 2018.](#)) It is absurd to replace 4D reality with infinitely compressible 2D reality and holograms, as Hawking envisioned. Nor can [the Vegas magic that stole the 2022 physics Nobel](#) after their *failed* 2018 quasar experiment negate the real fourth vector dimension of time itself.

## Beyond Big Bangs

A real local universe can only contain at one 3D frame of reference so much *potential* imploding energy/mass before increasing push/shadow forces eventually force a local big bang.

One model furthermore assumes that all imploding matter/energy came together in a simultaneous *spherical compression*, which is almost impossible to orchestrate. Otherwise there could have been several maybe big bangs, or just one oddly shaped explosion. Modern astronomy theory has eliminated such weirdly shaped big bang models, so that not every bang is a big bang.

There is another way to replace one fading local universe with others. Over trillions of years the assumed cosmic "second law of thermodynamics" will sufficiently dissipate through entropy the previous negentropic structure of any local universe:

As matter and energy drift away from a dissipating central region, the resulting partial void is incrementally replaced by incoming matter and energy from juxtaposed universes. In this scenario a new universe inside a previously occupied volume should dialectically arise without another local big bang therein. Still, our own universe's astronomical evidence clearly points toward a local big bang as being our most likely alpha point.

Common black hole implosions that never alone create new universes typically form when there are incoming compressions insufficiently instantaneous, not spherical, and insufficiently massive to form another universe. Rarely, preconditions seem to become "sufficiently coordinated" to allow more than a persisting black hole core mass within its larger event horizon.

When what has been wisely called *quantum pushback* is no longer strong enough to resist the net inward flow, a new local universe can form. This is [how one source describes the inflation](#)

**origin:** “When the universe was very young – something like a hundredth of a billionth of a trillionth of a trillionth of a second, it underwent an incredible growth spurt. During this burst of expansion, which is known as inflation, the universe grew exponentially and doubled in size at least 90 times.”

We have enough difficulty modeling our own recent big bang. The fun model of local “universal bubbles” comprising a vast community of gravitationally adhering universes is far beyond experimental physics of the old school – but not beyond elegant inductive envisioning in the spirit of what we can know about the laws of physics within 4D reality. Finite humans will be “on duty” on our rock only for a very brief cosmological time. Inductive math tools to model the 4D multiverse are the best we will have in the future. In contrast, there is no level of rational induction that can envision the psychedelic M-Theory multiverse.

## **How Hyperluminal Expansion Occurred**

I recoil at the loose use of the symbol for infinity – and also such terms as absolute zero which are not numerical zero. Not only can we never know the origins for everything, we cannot model very far into the potentially infinite future.

*Absolute zero* as currently defined is also merely the point where molecules stop bouncing around. This precise temperature is not absolutely zero within the foundational physical realm of much smaller matter/energy particles, the building blocks of it all, including molecules.

The smallest physical dimension is where *real quantum pushback* occurs, which dialectically yields the largest cosmic structures. Subatomic “quantum push-back” is vastly more important than Einstein’s molecular Browning motion.

In Einstein’s early physics period the constant speed of light in a vacuum was clearly understood with correlating math, thanks to



19th century work by Maxwell and others. What was not ever understood was [how and why this precise and consistent vacuum speed is always generated](#). Photon birth causality was not early deemed necessary for experimentalists to generate workable correlating equations (mostly from refined reverse-engineered sets of data) to fit spacetime correlating cosmological theory.

None of this old correlating physics theory related at all to real photons of different spin frequencies, and in "beaded strings," as well as to the simultaneous relationships between matter and energy. It is not enough, for example, to perform what appear to be supersymmetric, entangled slit experiments to functionally describe immeasurable quantum world dimensions.

Physics has for too long been comfortable with make-do "hard" knowledge within a limited part of the full EM spectrum – happily reverse engineering things like [GPS technology which is causally push/shadow gravity, not imaginary gravity branes](#).

Standard physics theory properly models that there was a very brief hyperluminal burst period that enabled the non-visual, pre-photon region of our otherwise new universe to exist. A better causative physics is now needed – including explaining how inter-universal push/shadow net gravitational forces could be cleverly misinterpreted as unproven dark energy.

Regular readers of my scientific essays should already be clear as to how photonic units precisely emerge with equal velocity as beaded strings of different lengths, which allows us to abbreviate photonic speed in vacuums with the simple letter "c" as explained in the blue links above.

What is obviously different from the snapback emergence of photon strings is how big-bang hyperluminal matter/energy can initially proceed from the same frame of inertial reference even faster than the terminal velocity of new yin/yang photons in a vacuum. We need (and now have) a new 21st-century paradigm, not new imaginary math correlations based on antique ideas.

There are ways to slow down luminal photonic speed within certain transparent media, even approaching no speed. Slowing down photons is easily accomplished in any physics lab, including re-acceleration when new photons on the same vector path return to full speed during luminal re-emission outside slowing media.

Going hyperluminal is much harder within one original frame of reference, and it does not employ hypothetical tachyons, nor are multiple new accelerating frames of origin required. Hyperluminal inertial speed requires a different process, as detailed below. It would be possible within any actual big bang to create, expose, and accelerate hyperluminal primary EM particles which are no longer bound within yin/yang [Coulombic](#) spheres.

Consider the idea of spherical yin/yang smallest particles, individuals of which are near the logarithmic dimension of 10 to the minus 38 meters size. This individual linear size rivals the idea of individual quantum mechanics (QM) quanta below the Planck linear limit of  $10^{-35}$  m. The apparently random aspect of quantum dynamics (QD) seems from this perspective to be a measurement issue defined by our limited powers.

Slowing down a photon's speed or spin is *not dimensionally equal* to slowing down the internal matter/energy components of photons, and that includes photons modeled as fields. Freezing is only possible by us on a larger scale with molecules that stop vibrating at "molecular absolute zero."

Conventional physics equates the brief period of big-bang hyperluminal acceleration with the correct idea that photons do not appear until after energy cools enough on the outward journey for photons to form. That model could be clarified to first include the emergence of primal matter within pre-photonic energy fields. The field idea is close to, but not equal to, what really happens.

It also has been assumed that photons are virtually without mass, and so therefore are easily accelerated to "c". That idea lacks a convincing inertial explanation for the limited initial acceleration of energy/mass units within fields or by themselves.

It is has even been claimed in quantum field theory (QFT) that photons may not really exist, but may only be the intersection point of two spacetime branes. That odd idea goes with the goofy math model of omnipresent gravity branes being 2D. Again, what about the QM idea of quantum randomness? Competing exotic physics theories must get really creative to describe the zoo of things and phenomena that do not fully exist as advertised.

**Let's now envision how hyperluminal speeds relative to a common initial inertial frame of reference are achieved:**

Hyperluminal particle acceleration during a big bang has one common *initial inertial frame of reference*, which occurs during an extremely brief phase of the formation of a new universe. In contrast, standard black holes of any size, ranging from stellar to supermassive, are not quite able to achieve *full* criticality; so no hyperluminal speed is realized at any time. Thus the formation of a large and permanent black hole from nearly spherical net gravity impacts of yin/yang particle structures can occur.

I leave open the possibly of two or more very supermassive black holes forming a new universe as they mutually annihilate. Again, such multiversal events would be very rare. A new local universe cannot occur when two ordinary black holes of any size only merge. The very process of new universal creation initially involves the full explosion of any previous primeval local black hole or holes.

The great quantitative power difference between "ordinary" atom bombs and hydrogen bombs illustrates the qualitative difference between incremental impactor black-hole formations, and spherical implosion-type universal black hole formation:

An atomic bomb reaches a critical fission mass when two nearly critical uranium isotope masses are brought together, creating a fission explosion. A plutonium hydrogen bomb by comparison occurs when an atomic bomb is used as the *compressing trigger* to create a much more powerful fusion explosion. Amazingly, none of this violence involves disrupting individual yin/yang virtual Coulombic envelopes.

No human-created compression device has the potential to generate anything like a new big bang, because the integrity of individual yin/yang spherical units remains intact. That includes the relatively weak CERN supercollider, or any future generation. That weakness is a blessing, because there are political idiots on this planet who would push the doomsday button if they could.

Let us now examine why we can create thermonuclear bombs, but not a massive black hole, and definitely not a new big bang. This answer requires examination of yin/yang matter/energy spheres themselves.

Y/y spheres are held together by primary electromagnetism, not by incoming bombardment of these multiversal quanta-like spheres and their beaded strings. Even though any cosmic impactor force would be massive relative to the impacted sphere's size, the key to these small EM spheres surviving is in two ways their size itself:

First, each impacted unit has a small surface area, which means they can receive only so much impactor energy at any moment. Second, each y/y spherical unit (impactor and impacted) is held together by its own Coulombic EM force.

Both Coulombic EM force, and "gravitational" force follow the inverse square distance/power relationship that Newton first explained. Within electromagnetism (EM) there are two basic things going on: electrical and magnetic forces. Typical electrical force is dipolar, which means there is a plus and a minus, as in batteries. **Magnetic force is like gravity in acting at great**

distances, as does net push/shadow gravity. Electrical force does not have much distal reach, which creates problems for ordinary power line distribution over many miles; but is not weak at the smallest linear dimensions where primary electrical forces are strong, and can be released as positive/negative energy.

In quantum physics there is much discussion around the ideas of points and fields. Original quantum mechanics (QM) that Bohr and others modeled was more like the so-called standard model of particle physics, the classic physics standard. More recently the field of quantum research is mostly quantum field theory (QFT), emphasizing fields over points.

The idea of an event horizon is central to black hole theory. The Schwarzschild radius is a formula relating to spherical black holes and the virtual sphere where anything that enters cannot gravitationally escape.

[Stephen Hawking was invited to privately meet in Moscow (while he could still walk) with two leading Russian nuclear physicists. The Russians graciously revealed their discovery of energy radiation by quantum action at event horizons, so that any black hole could eventually evaporate. Hawking went back to England where he immediately falsely claimed for a few years that he alone had come up with the idea, naming it *Hawking Radiation*. For this brazen lie and others, Hawking fans quickly entombed his Pi-Day (March 14) cremains between Newton and Darwin.]

Within ordinary black holes there are incredibly vast numbers of intact 3D yin/yang spheres in close proximity, because the net gravitational pressures therein are not yet sufficient to destroy their Coulombic integrity. It is critical to note that these smallest 3D spheres by themselves have small virtual force field diameters superficially similar to the much larger black hole event horizons. However, black-hole gravity shells are quite different with their net push/shadow gravity event horizons.

The y/y spheres' Coulombic virtual horizons maintain integrity of the vast primary energy inside, not by trapping external masses. Within the individual y/y spheres there exists what amounts to multiple forces at peace. Within y/y spheres there can be no quantum "Hawking radiation," as there are no "quanta" that can radiate out randomly – which leads to y/y spheres being virtually immortal, with one exception:

In Nichiren Buddhist philosophy there is the fundamental idea of *rengé* (pronounced: ren-gay). Even though this word comes from the lotus flower, the greater idea is the simultaneity of cause and effect. Within y/y spheres we envision *rengé* at work, as all elements of EM are peacefully simultaneous.

On the other hand, things would be quite different if ever the y/y EM spherical force field were disrupted, with internal primary EM morphing into escaping dipolar EM. Here's where things get really interesting, and some old physics-theory clouds evaporate:

Up to and including such phenomena as supernovae and black hole formations, there is no evidence of new hyperluminal energy momentum. The exception is what briefly happened during our local universe with its one Big Bang. Our post-BB new universe also set the stage for the [emergence of humanly visible photonic luminosity](#) over 380,000 years later when enough new photon strings assembled.

**Indeed, the defining difference between the creation of a long-lived black hole of any size, versus instantaneous universe-generating compression, is whether or not yin/yang spheres lose their tiny Coulombic event horizons.**

The idea of creating black holes has been around for a long time, but not the idea of how [correctly formulated push/shadow gravity persists inside black holes, as I have earlier explained](#). Also, the presence of some "empty" space within and among y/y spheres is important for so-called quantum randomness:

EM interiors of  $\gamma/\gamma$  spheres persist in motion, leading to inertial Brownian-motion between and among any cohesive collection. If ever potential quantum pushback stops, we will have reached the true "absolute zero" physics state. Even this level of "quantum" stoppage is not mathematically zero, but it could be the "physics absolute zero."

Current nuclear science is playing in the dimension of splitting molecules and atoms, sometimes smaller components such as quarks; but not much smaller yin/yang fundamental components, which is good for life on Earth. Even hydrogen bombs exploit only a tiny percentage of their potential explosive power. That potential is only realized within big-bang-creating explosions, not within black-hole compressions or weak nukes.

Because it is not always necessary for a big-bang explosion to instantly open up space for every new local universe, it is also possible to model for others *infilling negentropic energy/matter*. Any very old local universe dissipates over trillions of Earth years, due to its local increase in entropic chaos. Infilling opportunity increasingly arises for newly arriving negentropic elements, without the need for a big bang explosive drama. In this way there could be individual universal space occupations, not pure voids leading to eventual negentropy. The basic "bubble universe" model may or may not need to be supplemented by partial universal voids.

Some decades ago it was fashionable for field theorists to claim that photons have no mass. That naive model has been replaced by photons that either don't exist at all outside fields, or are minimally massive. This leads to examining the "contents" of individual  $\gamma/\gamma$  spheres. I start with an idea that I have employed in earlier essays: the idea of primary EM.

*Primary EM is an ideal version of renege.* Simultaneous close proximity of all EM types allows, upon release, for different expressions of each  $\gamma/\gamma$  sphere's packet of energy/matter.

## **Ten aspects of the simultaneity of energy and matter:**

*First, the speed of photonic light creation is the direct product of inertial rest mass times the force of snapback acceleration of each stretched, beaded 3D photonic string. As all yin/yang spheres have equal internal components and size, and as all yin/yang spheres and beaded strings only stretch so far before they snap apart and snap back toward individual spheres at "c" from their super vibrating bases, the result is "c" in a vacuum. This action produces both frequency (color), rotation or spin, and other unique "quantum" aspects of each tumbling, twisting, beaded photonic string. (The words here are complex, but the idea is very elegant, more so than imaginary branes.)*

*Second, the rate and time of acceleration is also critical, and it is implied in the  $E=mc^2$  formula. That formula needs to be more clearly stated as  $E=mc^2/T$ . In this better version we keep Newtonian inertial mass as earlier. We use "T" to indicate the "unitary time" each snapback takes from attachment to final velocity in photonic beaded string emissions. (Einstein's formula is OK as is when "T" is understood as 1 "acceleration time unit," or not written at all. The unit of "T" in this case is the time for any photon string to accelerate from its base to its terminal velocity.)*

*Third, the idea of primary EM is important, but only on a very tiny and local scale. Furthermore, since primary EM within y/y spheres does not involve the "c" process, such primary energy can accelerate hyperluminally within its tiny space, yielding true simultaneity. The unlimited inverse-square aspect of magnetism remains the same at distance. However, within primary EM the electro element can either be non-polar, or bipolar as usually understood. Nonpolar allows for beads of adhering photons – and their force can express either polarity at the end of each string, or even anywhere else on the chain where two beaded strings attach between extremes. Thus, both proximal cohesion and adhesion are possible within primary EM, all at hyperluminal simultaneity.*



Note that the formula allows for much greater kinetic energy as the time of acceleration to achieve hyperluminal speeds drops. **Energy that creates hyperluminescence is energy that can create a new universe when many shells together vanish.**

*Adhesive versatility* also allows for multiple attachments among new beaded strings and their yin/yang bases, which could be rings or even vibrating clumps of adhering y/y particles. This dialectical growth seems complex, but is simple, like interlocking Lego blocks, with EM mutual attraction.

Fourth, *the enclosing Coulombic virtual sphere associated with each yin/yang sphere is mighty, but not omnipotent.* It is not broken during the formation of regular black holes, which allows quantum pushback to persist, and for each BH core to have a small diameter.

Fifth, because the compression force during an exploding big bang is so great, *it is not necessary for the entire collection of pre-big-bang spheres to instantly rupture.* The ultra-energetic presence of juxtaposed exploding spheres that have just lost their virtual shells is *enough to trigger a nearly instant cascade of others, leading to elimination of nearby y/y spheres as such.*

Sixth, *our historical local universe went through a "dark" period* where yin/yang elements had to "find each other" and establish new virtual Coulombic shells, and then beaded strings. *Mutual discovery* took roughly 380,000 modern Earth years to where enough visible stars and other photonic phenomena assembled, some of which we now enjoy with the Webb telescope.

Seventh, *not everything recombined into new photons.* A large percentage of newly formed yin/yang spheres kept bouncing around as "dark foam," most never to link up into beaded strings. Local and other random, omnidirectional, multiversal quanta from other local universes *are much of today's push/shadow 4D gravity.* Note that collections of "darkness" can either be fairly stationary, or rapidly zipping about the entire multiverse.

Many other particles formed *so-called dark matter beaded strings with spin frequencies too high for our puny science instruments to register*. Ironically, *the most dark (to our instruments) photonic strings are actually the most brilliant*, but not perceived as light, but only as energy and mass. Their mass helps us locate unseen push/shadow players in distant space.

Eighth, many individual  $\gamma/\gamma$  spheres and assorted non-photonic strings also now form the fairly static so-called “quantum foam” that quantum theorists weakly envision to explain how and why *there is no pure space void*. The old cliché is true: Nature in its own way does “abhor” a pure vacuum.

Ninth, because *the mass element is always within EM*, there is *always inertial resistance to applied force* that is itself never infinite. With the breakdown of  $\gamma/\gamma$  spheres and so-called quantum pushback, the explosion component of a universal big bang is not limited by the separate mechanism that launches each new photon from its vibrating base, nor is it infinite. *This yields the non-visible portion of our visible local universe*.

Tenth, hyperluminal acceleration is by definition faster than backward photonic information, which means we have no way to receive our original BB data from beyond our visible universe. Still, *the fringes of our expanding local universe do not escape interaction with other universal masses beyond our own*. Some data from beyond our local universe will randomly find its way eventually to the fringes of our local universe, as well as into the greater 4D multiverse.

## **ANSWERING THE TITLE QUESTION:**

Neither theoretical nor experimental science can ever know how large is our extending, ethereal, local universe. As our expanding border becomes more ethereal, the idea of any border for our universe becomes itself more ethereal. Finitude can never enclose or fully embrace infinitude. The total future terminal volume (if there is such a thing) may never be reached – or it all may just merge after many billion years into irrelevance inside the ever-changing, seemingly eternal multiverse.

