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Abstract:

Big bang theory encounters much contrary evidence that doesn't conform to its assumptions and researchers would like to see a model that makes more sense. This paper posits that most of the problems with the Lambda Cold Dark Matter/Inflationary model stem from its arbitrary assumption that the big bang created the universe. Negating that assumption and superimposing the big bang on an older and grander universe transforms the seemingly anomalous evidence into a stunningly cohesive picture. It portrays a more natural universe whose observable machinery is constantly producing big bangs and all the other behaviors we see. This model is one of a simple and logical 3D universe that can be explained with no need for dubious physics or supernatural dimensions. It appears that big bangs are simply the way the universe recycles its home-grown singularities.

Keywords: Anthropic conditions, antimatter disparity, Big Bash model, cosmological principle, creation model, dark energy, Inflation model, quasars, singularities

Introduction

The goal of the Inflationary Big Bang model is to establish how the big bang gave rise to our universe[1]. That model, with its adjustments and extensions, has prevailed since 1980 and is broadly accepted as the standard or concordance model; with concordance meaning the model agrees with evidence researchers present[2].

Evidence that there really was a big bang is overwhelming. Scientists now generally agree that galaxies and their contents appear to have evolved from residues of a dense singularity that exploded some 13.8 billion years ago. Yet, the Inflation model's expansion encounters some unexpected twists and turns that can only be explained using speculative physics.

In 2004, 34 scientists endorsed "An Open Letter to the Scientific Community" in which they complain about "fudge factors" plugged into big bang theory to explain findings that are not concordant with the concordance model[3]. That letter has since been endorsed by more than 500 scientists and institutions[4].

A common complaint is that the standard model is so obscure one can't find connections between its math and acceptable physics. The math is often based on an assumption that forces impinge on our universe from non-verifiable spatial dimensions. This makes it impossible to visualize how proven physics drives that model's machinery. It's become fashionable to explain any anomalous findings as the result of vector forces emanating from supernatural dimensions. String Theory proponents say their approach is warranted, as the list of viable and tangible 3D models has been exhausted[5]. This paper takes exception to that view.

The foundation of the Big Bang model was laid in 1927 by Georges Lemaître, a Belgian priest who said the expansion of the universe might be traced to a "primeval super-atom", prior to which neither space nor time existed[6][7]. His conjecture provided the foundation for the 1980 Inflation model and describing the "creation of the universe" remains as the goal of the standard model[8][9]. The author believes this arbitrary founding assumption has led to the compounding of errors in the standard model.

While big bang nucleosynthesis (BBN) theory is supported by convincing evidence that our big bang produced basic particles that are evolving into heavier elements; there is no BBN evidence that our big bang produced *all* of the universe's matter[10]. Current theory, then, is based on a totally unsubstantiated assumption that the big bang created the universe. Yet, there's a growing body of evidence that our big bang did *not* create the universe.

The challenge that stimulated this research stems from a long list of mysteries for which the standard model either has no answer or provides dubious answers that are not disprovable. Here are twelve of the many questions these mysteries pose:

- How can structures be larger than the cosmological principle allows?
- How can there be structures older than the big bang?
- What causes dark energy behavior?
- What causes big bangs?
- What will ultimately become of our expanding big bang?
- Why is there vastly more matter than antimatter?
- What gave the cosmic microwave background (CMB) its uniform temperature?
- What gave the CMB its rough texture?
- What formed the galaxies?
- What caused the early genesis of stars?

- How did we get so many quasars, back when stars were just beginning to form?
- How did improbable anthropic conditions evolve, in just 13.8 billion years?

This analytical work treats those mysteries as compatible puzzle pieces that fit together nicely in a less constrained picture of the universe. Each of them has been analyzed individually, but I've never seen an analysis of how they all might be related. My sense is that they would all have straightforward solutions if our big bang took place in a preexisting universe whose general characteristics look like multiple layers of past big bangs. This qualitative analysis doesn't demand a lot of mathematical rigor, just some sound logic and critical thinking.

I'll describe each of the puzzle pieces in more detail as we broach their topics. Combined, they produce the image of a grander universe, whose simple mechanics are logical and easy to visualize.

We'll start by contrasting the two assumptions of whether or not the big bang created the whole universe. Here's a basic overview of these alternative assumptions:

The current "creation" model is based on an explosion that created the universe out of a hot mass that burst forth from a singularity that appeared from out of nowhere and was surrounded by nothing but emptiness. The best way to explain its formation from nothing is to assume half of its mass is matter and the other half is antimatter. That way if you add it all back together it annihilates itself and you end up where you started from, with nothing.

In the absence of other influences its hot matter should expand smoothly with no means for texturizing it and only its internal gravitational force to slow or contain it. One way to give it texture would be to throw in a brief hiccup at the beginning of its expansion. This "inflation" preamble could also be used to hold all matter in contact for an instant in order to give the big bang a uniform temperature in all directions. While the big bang is engulfed in electromagnetic energies, there is no reason to expect them to behave non-uniformly.

That's it! Nothing else existed. So theoreticians have to be very creative in order to explain all of the anomalies we see in the big bang's expansion.

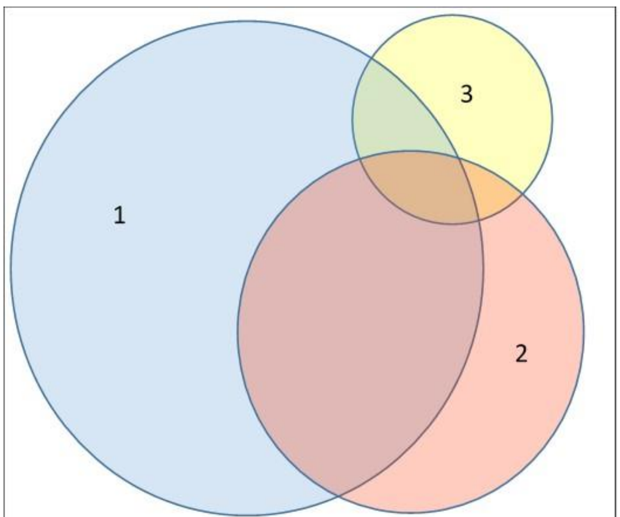

Figure 1: Three overlapping big bangs in a common universe

Sphere 3 represents our big bang. It overlaps two progressively older and larger big bangs, creating unique environmental domains.

In contrast: If an older, vaster, and far more massive universe creates big bangs, it would have all the background environment necessary to explain everything researchers are finding—without any need for unproven physics. And it would do so in the confines of a natural 3D space. Imagine an ancient universe littered with prior big bangs. Their expanding spheres overrun one another, creating overlapping domains (see fig. 1). Recent big bangs are hottest, smallest, and most uniform in density. Older ones are colder, larger, and lumpier—due to overrunning, or having been overrun, by other big bangs. The oldest and coldest of gravitational structures act like heat sinks, easily attracting and cooling the hot new gasses of recent bangs.

Each new big bang behaves much like those that preceded it, with the most notable variables being their initial masses and energies. This simple model provides a virtually unlimited means for explaining all of the anomalous structures and processes we see within the bounds of our own big bang.

Perhaps the following axiom already exists somewhere; if not, I'll coin it:

> *Given sufficient mass, energy, and time; every valid permutation and combination of mass and energy is possible within the realm of a single, unbounded, three-dimensional space.*

So, in answer to mathematicians who believe string theory is required to explain all the anomalies being reported, I ask: Would you still believe that if we were to dispense with the arbitrary assumption that the big bang created the universe? Likewise, it appears that we don't need an inflation preamble to the big bang during a window of time when the laws of physics didn't apply. There was no such window.

This proposed model lacks the 85 years of mathematical assessment the creation big bang model has had. I believe, however, mathematicians can more confidently verify—or falsify and evolve—its assertions, with a fraction of the effort that's been expended on the creation model, even though this expanded model has more moving parts.

Some obvious mathematical reformulations would be based on assumptions that:

- Space preexisted and is not being created by our expanding big bang.
- Not all of the mass observed within our big bang was created by our big bang.
- The cosmic microwave background temperature is not a result of the cooling of our big bang, but is its homogenization with that of the older universe.

So let's examine how a non-creationist model might work without dubious physics or forces emanating from supernatural dimensions. Instead of examining how the big bang magically spawned our new universe, we'll examine how our old universe naturally spawn big bangs.

Structures that are too big

The Sloan Digital Sky Survey (SDSS) project includes a huge consortium of scientists and an awesome array of instruments that produce sky maps and a database researchers mine to portray increasingly refined images of cosmic structures[11,12]. Some structures exceed the size theoreticians believe the big bang is capable of generating[13].

The cosmological principle says that on a sufficiently large scale the universe is both homogeneous and isotropic, so its mass should be distributed fairly uniformly throughout its volume, with a limit as to how large any structure can get[14]. Theoreticians say this upper structural limit is no more than 1.3 billion light years across; yet the data reveals structures that are much larger[13].

In recent years a classification of cosmic bodies was added to accommodate new structural groupings. They're called large quasar groups (LQGs). These are walls of galaxies having large numbers of quasars. In 2013 an LQG was discovered that marked the start of a Huge-LQG class. This first HLQG has a mass greater than 10^{18} solar masses and is 4 billion light years across.

I call it the *first* HLQG because instruments for identifying these structures are just starting to evolve and, if this new model has merit, we'll find structures 10,000 times as massive as this HLQG. The logic behind this assertion is: "The larger universe contains our own 10^{22} solar mass big bang, so its upper structural limit is at least as massive our big bang".

Since I originally published this projection an even larger great wall has been reported. It is the Hercules–Corona Borealis Great Wall, which is 10 billion light years across, 7.2 billion light years wide, and 900 million light years thick[15]. As of February 6, 2015 it was the largest structure yet to be reported. I suspect there are many more such records to be broken.

These huge structures don't mean the universe is not homogeneous and isotropic or even that the cosmological principle is wrong. It merely means that mathematicians did not use a sufficiently large scale when they calculated the limits of the universe's isotropy.

Structures older than the big bang

It's now apparent that there "is far more large-scale structure in the universe than the Inflation model can explain[16]." In big bang creationism, all matter is flowing outward from the center of the big bang; so in order for huge clusters and Great Walls to form, much of this mass would have to slow its outward momentum and even reverse its direction. That takes a really long time! Astronomer Thomas Van Flandern said, "To form these structures by building up the needed motions through gravitational acceleration alone would take in excess of 100 billion years."

A.K. Lal and R. Joseph gathered the results of several such large structure investigations and concluded that many Great Walls and Great Voids took five to twenty times longer to form than the age of the big bang[17]. "…there are galaxies crashing into each other from every conceivable direction. There are in fact rivers of galaxies flowing in the wrong direction." There hasn't been nearly enough time since the big bang for these structures to form; especially since much of that mass has had to reverse its outward flow in order to become part of the structures. While astronomers claim data from a host of astronomical instruments confirms the Inflationary Big Bang model; Lal and Joseph say, "… these claims are based on interpretations of data which are guided by the belief that there is no alternative explanation. Hence, rather than the data shaping the theory, the theory of the 'Big Bang' dictates how data are interpreted and even which data should be included vs. ignored."

While it was not unreasonable for theoreticians to assume the big bang created the universe; we now see evidence that the universe is far older than the big bang. This new model posits that the big bang took place within our universe's preexisting 3D space and the evidence suggests our big bang is but a local event within a vaster universe than the standard model describes.

Dark Energy

The 2011 Nobel Prize in Physics went to Saul Perlmutter, Adam Riess, and Brian Schmidt for their discovery that the big bang's expansion is accelerating[18]. More accurately, the prize was awarded for their discovery that the *universe's* expansion is accelerating; as the creation model posits that the big bang *is* the universe.

The mysterious force accelerating this expansion is referred to as dark energy and, from our perspective, it behaves like negative gravity[19]. So when dark energy modulates the expansion, we find an early decelerating expansion caused by the big bang's own gravitational mass; then—some 8.8 billion years later—the dark energy caused a gradual reacceleration[20]. There is no apparent mechanism to stop this expansion and, from appearances, the universe's three spatial dimensions are in the process of becoming infinite—if they weren't already infinite.

This sort of decelerating and reaccelerating velocity profile is quite common in the field of ballistics. Here's a simple example:

If we shoot a projectile to earth from our moon, the moon's gravity decelerates the missile until earth's gravity becomes dominant; then the projectile reaccelerates during the remainder of its journey to earth. If our view beyond the departing missile were obscured the way big bang matter obstructs our distant view of the universe, we'd sense that the missile had encountered a negative gravity; the same sense we get when observing our reaccelerating expansion. So the big bang's expansion appears to have the same velocity profile we'd expect to see if our big bang is surrounded by other colossal masses that share its 3D space.

This reacceleration in all directions would indicate that there's more mass in any given direction beyond our big bang than there is within it. The masses of, and distances to, these outlying attractors would be random, so our expansion would not necessarily be uniform in all directions. Thus, in an all-natural 3D world, dark energy behavior also supports the hypothesis that our big bang took place within a much older and grander universe.

What could cause big bangs?

Our big bang fits neatly into a greater universe who's observed processes produce even more big bangs—or more descriptively, *big bashes*.

Gigantic galaxy groups contain tens of millions of galaxies clustered in strings, sheets, and walls billions of light years across. These clusters continue to grow in mass for as long as there are nearby objects to attract and merge with. But if our big bang contained all of the universe's matter, as the standard models posits, even the largest superclusters will grow to but a tiny fraction of the big bang's mass, since their trajectories are accelerating outward and away from one another. The big bang's mass is not sufficient to ever pull them back together again.

These huge masses are compacting into ever fewer and more massive galaxies and black holes. Given enough time, each cluster will eventually be rendered down to a single massive black hole. However, since the clusters are accelerating outward, it seems there is far more gravitational mass where they're headed. So what could possibly stop their endless growth? It looks like our older universe easily has the means to grow black hole singularities sufficiently massive to source big bangs—like our own.

Once a black hole has been formed by the collapse of a massive star, it behaves like a gigantic vacuum cleaner gathering up the matter of anything that comes near. Even the tens of billions of neutrinos that pass through every square centimeter of ordinary matter, every second, cannot pass through a black hole and are permanently captured. The growth of black holes never pauses from the moment they're born.

Black holes squeeze particles until they collapse and can no longer move. In the process all of their heat gets squeezed out. Stephen Hawking tells us that the more massive a black hole becomes, the lower its temperature gets[21]. He says, "A black hole with a mass a few times that of the sun would have a temperature of only one ten millionth of a degree above absolute zero."

He also says black holes will absorb more mass than they emit until the background temperature falls below the temperature of the black hole. At that point the black hole will begin its virtual eternity (10^{60} years) of slow evaporation (more on this, later).

Now, if we had a black hole ten billion trillion times more massive than our sun—on the order of the big bang's mass—with an absolute zero temperature, it would have no rest energy. The speed of light reaches its maximum in the vacuum of space, slows through water or glass, and comes to a complete halt in a black hole. So based on $E = mc^2$, c equals zero in a black hole and the rest energy of singularities would, therefore, also be zero, making them the most stable masses imaginable. What could possibly cause such a mass to blow itself to smithereens?

One mission of CERN's Large Hadron Collider is to smash heavy particles together at near light-speed, in order to simulate big bangs[22]. Well, ultra-massive black holes are pretty heavy particles and gravity would be the only force capable of smashing them. Nature would need *two* such singularities to generate big bangs.

The structure of the universe is being mapped using SDSS Galaxy Map composite images. As mentioned, this work is revealing structures both older and larger than legitimate big bang components. What we see is a 3D web that resembles a stringy cotton candy whose strands of galaxies vary in length and thicknesses. Since much of this massive structure appears to have been overlaid by our big bang; it seems reasonable to expect that these structures represent a general characteristic of matter scattered throughout the universe.

The big picture is one of intertwining streams of galaxies whose intersections form galactic clusters, like knots that bind the strings of fishnets. Their concentrated masses are gravitationally compacting and reeling in the strings of galaxies, forming superclusters and great walls. The oldest, coldest, and most dense regions of the web pull hardest and the thinning filaments—pulled in opposite directions by opposing masses—eventually break, creating tears in the cosmic fabric and forming vast islands of web segments. The surrounding space becomes mostly empty as galactic matter is drawn in by black holes that merge into ever more massive singularities. Over hundreds of billions of years each island gets rendered down to a stringy ball of dense matter rotating around a massive black hole singularity that has already begun to drift toward other great masses.

The mass of central black hole singularities is normally overshadowed by the far greater masses of their host galaxies. So when galaxies collide and merge, they do so in a relatively slow motion manner. Galaxies are mostly empty space and just pass through one another, oscillating back and forth for millions of years before becoming fully merged as a new galaxy. In that process, their central black holes eventually find one another and merge without any overwhelming explosion that obliterates the new galaxy.

In contrast, our massive isolated islands of matter are being rendered down to dense super galaxies and ultimately deposit most of their matter in the central singularities. The singularities overwhelm the masses of their galaxies and create gravitational focal points that attract other such singularities to smack them head on.

Black holes have a Schwarzschild radius (event horizon) in which matter entering cannot escape[23]. The radius is proportional to the mass of the black hole and for each solar mass equivalent it amounts to 2.95 kilometers[24]. So, assuming each of our big bang's singularities had 10^{22} solar masses, their Schwarzschild radii would each be 2.95×10^{22} km or about 2.8 billion light years. This lends some scale to the rips in the cosmological fabric and the island of matter surrounding each singularity. Two such singularities would become locked into one another's grasp while still 5.6 billion light years apart. Their double-bubble event horizon will continue to draw in strings of material from beyond its periphery. The two bubbles ultimately merge and become a single spherical event horizon with a 5.6 billion light year radius.

Let me clarify at this point how we distinguish black holes from singularities. Most scientists refer to all of the volume inside the event horizon as the black hole, but all of the mass of the black hole eventually arrives at a small point at the center of the black hole. This point, called the singularity, has essentially no volume and is treated mathematically as though it has infinite density.

Newton's equation for gravity's accelerating force is: $F = G(m_1 \times m_2)/d^2$, where G is his gravitational constant, m_1 and m_2 are the masses of our two singularities, and d is their ever closing distance. The masses are huge and as their speeds approach the speed of light, Einstein says their effective masses approach infinity.

Gravity's particle accelerator has an amazing feature, however, and during the last hour, while the singularity distances close from a billion kilometers to a nanometer; gravity's force gets cranked up a million trillion trillion trillion (10^{42}) fold. And since the radii of singularities are thought to be at or near zero, gravity's force continues to rise and also approaches infinity as the singularities pancake and splatter; transforming two of the coldest, most inert objects in the universe into a hot plasma cloud, expanding at about the same speed as the collision[25].

Big bash singularities act as entropy's rechargeable batteries. Einstein said, "The theory of relativity stresses the importance of the field concept in physics. But we have not yet succeeded in formulating a pure field physics. For the present we must still assume the existence of both: field and matter[26]." Singularities at absolute zero would seem to substantiate his assumption that mass and energy are separate and separable entities. This will be an important point when we get into characterizing gravity as an independent aspect of matter, but bestowed on matter in proportion to its mass.

For simplicity, assume our colliding singularities have equal mass and—being at absolute zero—each has a rest energy of zero. As gravity is drawing them together, each of their kinetic energies become: $E=½ mv^2$. As they reach collision speed, c, each has a kinetic energy $E=½ mc^2$. Summing those collision energies yields: $E=mc^2$, the big bang's total system energy. What this implies is that the inertial force of gravity is transformable into all of the other energy forms.

Within this Big Bash model, gravity sparks *all* of the heat, pressure, electrostatic, and electrodynamic energy forms when it bashes singularities together to create hot big bangs. Gravity later quiesces all those energies by squeezing heat out of the atoms in stars, where smaller atoms are transformed into ever more massive, but cooler and less energetic elements. It eventually halts their motion and quenches their heat by crushing them into neutron stars and ultimately back into the black holes from whence they came—often skipping the neutron star phase. As long as these active black holes have a source of inward falling matter to digest, the crushing and cooling process generates an axial spray of outflowing heat in the form of photons and electromagnetic energy.

The collision pulverizes the black hole masses and the resulting friction charges the electrons, muons, quarks, and any other particles that trap charges. Heat becomes the electromagnetic background that exists as photons, gluons, W bosons, Z bosons and any other pure energy packet that doesn't contain mass. The strong and weak forces seem to be externally induced electromagnetic forces, with the strong force being exhibited when quark spacing approaches or reaches zero.

Big bashes become natural phenomena when mass and space are unlimited. Bashes would come in many sizes; coexisting and comingling at all stages of their life cycles. Our bash took the form of a splat and ball of hot plasma, like the Standard model; but due to the preexisting background heat and cold dense background matter; the system is not smoothly inflating nor does the expansion create the existence of space—as space was already in place.

The colliding singularities were speeding toward one another while still drawing in strings of galaxies. Pressures within their Schwarzschild radii crush this matter into black holes surrounding the singularities at the time of the bash. These orbiting masses will be contributors to the rapid galaxy formation and cosmic microwave background (CMB) roughness we'll discuss shortly.

What is the destiny of our expanding big bang?

Over the past half-century researchers have expended great effort to understand the ultimate outcome of the big bang's expansion. They ask: will the big bang expand and thin forever; will the expansion slow, but never quite stop; or will it all collapse on itself in a big crunch?

The Big Bash model is a flat universe and its answer is simply "none of the above". Our big bang is being reabsorbed by the same universe that spawned it. The old cold universe is a perfect blotter for soaking up the spilled heat of big bangs.

Matter/antimatter disparity

One unanswered question the Standard model has is: why does the observed universe contain millions of times more matter than antimatter[27]? Since the Big Bash model provides a glimpse at what precedes big bangs; we'll examine the question in that context. Expectations change when we see big bangs and the formation of singularities as a cyclical process.

The notion that big bangs *should* yield 50% antimatter stems from the belief that the big bang's mass was spawned out of nothingness, and that nothingness needs to generate matter and antimatter in equal quantities

Big bashes don't take place in a spatial void, but occur in a preexisting universe that imparts its own biases. If the singularities involved in our bash were not made up of half antimatter to begin with, then smashing them together won't necessarily generate 50% antimatter. While it's not unreasonable to expect positrons and antiprotons to form during the bash, they would be nominal and fleeting—like they are today. The currently accepted model's expectation that matter and antimatter *should* form in equal parts is an expectation that stems from attempting to grow a whole universe from just one big bang. The Big Bash model doesn't have that problem. If the universe really is half antimatter, then any major concentration of antimatter must exist beyond the realm of our big bang.

The CMB's uniform temperature

The Inflation model asks: What gives our CMB its large-scale uniformity in all directions with a temperature that's uniform to a few parts in 100,000[28]? Since opposite sides of the big bang move away from one another at nearly twice the speed of light, they didn't get a chance to mix and blend uniformly. At this point that model deploys its Inflationary hiccup which briefly holds all matter in intimate contact and causes it to begin its long journey at a common temperature.

In contrast, our colliding singularities were each equally cold when they *also* came into intimate contact before pancaking and giving their expanding matter a uniform starting temperature. A more relevant question might be: What gave the CMB *any* temperature variation?

Background radiation is part of the entire universe; but our fresh big bang would contain a much higher concentration of heat within its own expanding bounds, in which both old and new radiation is homogenized as a single field. When hot, dense matter overlays an older, rarer, and much colder background, the hot mass may dominate by several orders of magnitude. As the mixed gasses cool, the small and varied old background heat ultimately accounts for virtually all of the minute remaining temperature gradients.

We should expect to find a cooler temperature out beyond our big bang's periphery, since the older CMB would be more dispersed and cooler. Still, this small background radiation should be adequate to rule out Stephen Hawking's notion that black holes will ever evaporate.

The CMB's rough texture

Another Inflation model question is: How did the CMB get its patchy texture if the big bang is expanding so smoothly? Here again, its warp speed inflation-hiccup can be used to amplify any quantum bubbles that might occur during the formation of particles. One problem this solution has is: How do you ever stop this multi-lightspeed-inflation momentum once it gets rolling?

The Big Bash model has a natural means for explaining CMB roughness, with no need for an inflation event. Our big bang simply overlaid an old background that was already populated with ancient cosmic bodies and it always did have a patchy texture.

Early formation of galaxies

In their analysis of galaxy makeup, P.J.E. Peebles & Adi Nusser conclude that while Big Bang theory provides a good description of our expanding universe, properties of nearby galaxies "suggest that a better theory would describe a mechanism by which matter is more rapidly gathered into galaxies and groups of galaxies[29]." If all new matter originated in a ball of heat, what would divide it up into galactic clouds? If it hadn't broken up, it seems the whole system would be a smooth gravitational mass that condenses uniformly, forming one star that becomes a single black hole in a single massive galaxy that smoothly collapses on itself in a big crunch.

While some colliding singularities may have consumed all nearby matter before bashing other singularities; it seems likely that most will still be drawing in strings of galaxies when they collide. The concentrations of mass in the colliding pinpoint singularities should be adequate to draw them together head-on, even while trillions of galactic remnants still orbit them.

When they bash and explode, even before the radiation cloud becomes transparent it starts to overrun billions of black holes in the orbiting debris. As the gas cloud blows past this orbiting matter, both radiation pressure and the passing gravitational mass will cause the orbiting material to spiral outward, shredding the cloud, and creating swirls that form primordial galaxies. This old debris provides the cold lumps we find imbedded in the primordial radiation[30]. It would be this mixing of old and new matter that breathed life into our big bang's smoothly expanding dullness.

It conjures a vision of an exploding cloud, orbited by strings of cold and compressed residue scattered throughout the 5.6 billion light year Schwarzschild radius. Beyond that radius lies a sparsely populated void that the expanding system has to cross before encountering the dense meniscus walls of ancient galaxy networks. This is where our bash's reabsorption by the old universe begins. The increasing gravitational pull of this old dense matter is a logical explanation for why our big bang's expansion is accelerating.

Early formation of stars

Within our recirculating steady state universe, massive bodies continuously sweep up most of what they encounter, but often fling smaller masses to distant reaches. Clusters grow denser while the surrounding spaces become drained of most of their mass, yet remain littered with orphaned stars, planets, moons, asteroids and comets. Spatial cleansing continues until another expanding bash refills vacated spaces with clouds of new gasses. Since those voids are still littered with old debris, the new gas clouds should find plenty of old cold objects from which to seed new stars.

Where did all those early quasars come from?

Quasi-stellar radio sources (quasars) are black holes millions to billions of times more massive than our sun. They're active black holes in the process of consuming any gas or stars that fall into their grasp, squeezing the heat out of all they consume. This is what makes quasars so bright, often outshining a thousand galaxies[31]. Most are found in early galaxies, within a few billion years after the big bang; so they're mostly old and in galaxies with a high redshift. Scientists struggle to find a way in which "supermassive luminous quasars" formed so soon after the big bang[32].

In 2013 a group of researchers submitted their analysis of an ancient proto-galaxy whose redshift dates it at 772 million years after the big bang[33]. It's illuminated either within or from behind by quasar ULAS J1120+0641. There was no evidence star formation had yet begun. A question this begs is: Where could such early quasars come from if their galaxies were not yet creating stars? It appears as though these supermassive black holes had already existed when proto-galactic gas clouds overran them. As discussed earlier, our new big bang seems to have been born with sufficient black holes to light up the sky with quasars and reionize the new gasses.

More than a million quasars have been cataloged[34]. Their quantity seems to have peaked less than a billion years after the big bang and there's been a steady decline in their population over the past 10 billion years[35]. In 2015, researchers, Xue-Bing Wu et al, reported one that existed just 900 million years after the big bang and had grown by then to a mass equal to 12 billion solar masses[36][37].

In 2010 Hilton Ratcliffe summarized his research and that of several colleagues concerned about the reliability of Hubble redshift as a means of measuring distance [38]. Much focus was on the fact that quasars tend to show significantly more or less redshift than their associated galaxies. On statistical distribution he says, "Halton Arp and associates found that three aspects of quasar distribution were anomalous: Their distribution amongst other objects, that is, the 2-D density of quasars on the sky, showed an inordinate prevalence of quasars paired in close (angular) proximity across Active Galactic Nuclei; objects apparently physically associated in space had physically varying redshifts; and the asymmetrical concentrations of isophotes on

AGN/quasar maps indicate that the quasars were moving away from the AGN, suggesting ejection"[39][40][41][42][43][44][45].

In reference to large-scale structure he says, "J. C. Jackson found an observational effect in galaxy distribution data that caused clusters of galaxies to appear elongated when expressed in redshift space, taking on the appearance of 'fingers' pointing towards Earth"[46].

These points and much of the remainder of Ratcliffe's summary suggest that dense gas clouds of the expanding big bang were in the process of overrunning preexisting black holes and turning them into quasars.

Quasars are the smoking gun! They don't co-move with their galaxies because they are ancient black holes being overrun by the new galactic clouds.

When ancient black holes are overrun by dense swirling clouds; instead of orbiting the black holes the gas plows directly into them and matter accretes prodigiously. Intense radiation forms as the black holes become quasars. This radiation holds back much of the outward flowing gasses, stretching the galaxies and creating those "fingers that point toward earth". A quasar's velocity, relative to its galactic cloud, may either propel it through the cloud and on to other clouds, leaving a long trail of cosmic debris; or it may slowly oscillate through a cloud's gravitational center and settle in as its central black hole. Once a quasar comes to rest at its galactic center and becomes part of the centrifugal/centripetal system, its accretion slows significantly, causing the quasar to dim and behave like an ordinary central black hole.

When multiple black holes arrive at a galactic center—being totally cold—they should be able to merge with one another without creating the spectacular light show that quasars provide.

What provides such hospitable anthropic conditions?

Our big bash inherits a host of heavy and complex molecules from the get-go, with remnants of old expanding bashes scattered throughout the universe. Their constantly mixing matter creates an anthropic world, loaded with the old and highly evolved molecules necessary to nourish life. These molecules are gathered, nursed, and dispersed to planets by trillions of wandering comets that are ubiquitous throughout the universe. Even manmade molecules may enter this stream to spread our legacy to future beings. Perhaps it was beings from distant worlds that designed our programmable RNA and DNA molecules and thus connected earthlings with the universe's conscious web of life.

In a steady state universe, improbable anthropic conditions become highly probable when nature can roll her dice, gather them up and roll them again, for as long as it takes to roll life's lucky numbers. And by continuously casting the seeds of the universe's past into the fertile energies of the future, nature could hybridize life into an infinite variety of big bang perennials. It's most advanced life forms may have been able to find their way through the hazardous maze of overlapping worlds and let their progeny continue evolving without needing to start over as single-cell creatures.

This is a philosophical bonus in that it suggests intelligent life forms may be able to wend their way through the minefield of cosmic hazards that eradicate less capable beings, like the dinosaurs. We have the technology necessary to ward off errant asteroids and will soon be capable of defending against incoming comets. In the long run we'll need to master space travel if our species is to survive. We have time to prepare for the merger of Andromeda with our Milky Way and we know our sun's expansion requires that we develop habitats beyond the earth.

We probably can’t pack enough on a spaceship to tour the galaxy. There are, however, zillions of orphan planets, moons, asteroids, and comets wandering throughout the universe. We should be able to catalog their trajectories and resources and use them as public transportation. It would seem fitting to call this bus schedule our “Hitchhiker’s Guide to the Galaxy”.

The energy and resources necessary to master space travel are daunting; but the sum of those resources is probably less than that which we waste on war. Our rate of cosmic mastery seems to be limited mostly by mankind’s underestimate of its desperate need for peace and cooperation. Hopefully, our collective wisdom will evolve in time for us to save Earth’s beautiful and highly symbiotic life forms.

Predictabilities

While matter at the periphery of our big bang is so red shifted it’s difficult to detect; even more distant blue-shifted objects may be approaching us and should be quite visible. The Hubble Space Telescope provides Deep Field photos that are speckled with blue dots [47]. Some may be young blue stars in the lensing galaxies, but it will be interesting to see if some of the fuzzy ones are more distant galaxies that are headed our way. We should be able to see incoming galaxies from far beyond the fringes of our big bang.

As technology lets us see farther out through deep field peepholes, we should find ever more distant objects peering back at us. The mixing of matter from multiple bashes will yield objects that are anomalous to the Inflation model, but make sense when viewed in the context of a larger universe. This dynamic churn creates unlimited possibilities. Its splats impinge on one another the way Set Theory’s spheres overlap to blend unique domains, each having its own predictive peculiarities. Ancient stars intermix with new stars, so we should eventually find dim white dwarfs that also witness to ages older than the big bang.

Discussion

Hopefully, presenting this 3-space inexhaustibility will lure the world’s mathematical genius back to our tangible world of three spatial dimensions.

It will take far more work to back-track this more complex universe and seek its beginnings than it took to rewind and examine our relatively simple big bang. While this Big Bash model provides a means for generating big bangs, it does not attempt to explain the creation of the universe. That yarn remains for future theorists to unravel.

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Author Contributions

Countless amateurs and professionals have contributed to my views over the years. This modeling of their input took place within my own imagination and I'm solely responsible for having documented it. I welcome input and will respond to as many e-mails as I can.

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