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Abstract:

Big bang theory encounters much contrary evidence and researchers would prefer a model that makes more sense. This paper posits that problems with the ΛCDM/Inflationary big bang model stem from the arbitrary assumption that the big bang created the whole universe. Just negating that assumption and superimposing the big bang on an older and grander universe transforms the evidence into a stunningly cohesive picture. It portrays a universe whose observable machinery produces 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 our big bang is simply the way the universe recycles its home-grown singularities.

Keywords: Anthropic conditions, antimatter disparity, Big Bash model, Creation model, dark energy, Inflation model, quasar, singularity

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1. 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 the 1980s and is broadly accepted as the standard or concordance model; with concordance meaning the model agrees with evidence researchers present[2].

Evidence of the big bang is overwhelming and scientists generally agree that galaxies and their contents appear to have evolved from residues of a dense singularity that exploded about 13.8 billion years ago. Yet, the Inflation model's expansion encounters some unexpected twists and turns that can only be explained using unproven 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 Inflation 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" is still the primary objective of the Lambda Cold Dark Matter (ΛCDM) Inflationary Hot Big Bang model[8][9][10].

While big bang nucleosynthesis (BBN) theory is supported by convincing evidence our big bang produced basic particles that evolve into heavier elements; there is no BBN evidence that our big bang produced *all* of the universe's matter[11]. 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 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 become of our expanding big bang?
- Why is there 100,000 times 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 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 should fit together nicely in a more cohesive and comprehensive picture. Each of these mysteries has undergone rigorous analysis, but I've never seen an analysis of their common characteristics. This qualitative analysis is both my goal and my methodology. I'll describe the puzzle pieces in more detail as we broach their topics. Combined, they produce the image of a grander universe, whose mechanisms are logical and easier to visualize.

We'll start by examining the assumption of whether or not the big bang created the universe. Here's a first principles overview of these alternative assumptions:

The creation model is evolved from a single impulse of hot mass that sprung forth from an infinitesimal point in a void that contained nothing but our big bang. In the absence of other influences, this matter should continue to expand smoothly with no means for texturizing it and only gravity's force to slow or contain it. The most logical way to explain its formation out of nothingness is to say its equation is balanced by creating half of its mass out of matter and half out of antimatter. And one way to give it a little texture would be to throw in a brief hiccup at the beginning of its expansion. This "inflation" device could also be used to hold all matter in intimate contact for an instant in order to give the expansions a uniform temperature in all directions. That's it! Nothing else existed; so theoreticians have to be veeerrrrry creative in order to explain all of the non-uniform structures we see in the big bang's expansion.

In contrast: If an older, vaster, and more massive universe had created our big bang, it would have all the background tools needed to explain everything researchers are finding and it can do so in the confines of our three empirical spatial dimensions. Perhaps the following axiom already exists somewhere; if not, I'll coin it:

Given unlimited amounts of 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.

This proposed model lacks the 85 years of mathematical assessment creation models had. I believe, however, mathematicians can more confidently verify—or falsify and evolve—its assertions with a fraction of the effort of creation models, even though this alternative model is more complex. So let's examine how a non-creationist model could work without dubious physics or forces emanating from supernatural dimensions. Instead of examining how the big bang spawned our new universe, we'll examine how our old universe might spawn big bangs.

2. 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 that researchers mine to portray increasingly refined images of cosmic structures[12,13]. Some structures exceed the size theoreticians believe the big bang is capable of generating[14].

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[15]. Theoreticians say this upper structural limit is no more than 1.3 billion light years across; yet SDSS data reveals a structure that's 4 billion light years across[14].

In recent years a cosmic body classification was added to accommodate new structural groupings. It's called large quasar groups (LQGs). These are walls of galaxies having large numbers of quasars. In 2012 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". 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.

3. Structures older than the big bang

It's now apparent that there "is far more large-scale structure in the universe than the Big Bang 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 to assume the big bang created the universe; we see increasing evidence that the universe is much older than 13.8 billion years. This new model posits that the big bang took place within our universe's preexisting 3D space and the evidence suggests that our big bang is but a local event within a vaster universe than the standard model describes.

4. 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. So when dark energy modulates the expansion, we find an early decelerating expansion caused by the big bang's own gravitational mass; then—some 5 billion years ago—the dark energy caused a gradual reacceleration[19]. 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 common in the ballistics field. 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.

5. 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 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 fewer and more massive galaxies and black holes. Each cluster is being rendered down to one 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.

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[20]. 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 our big bang's mass—with an absolute zero temperature and thus no internal energy; it would be the most stable mass imaginable. What sort of force 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[21]. Well, ultra-massive black holes are pretty heavy particles and gravity seems to be the only force capable of smashing them. Nature would require *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 dense superclusters. Their concentrated masses are gravitationally compacting and reeling in the galactic strings. 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. Over hundreds of billions of years each island gets rendered down to a stringy ball of dense matter rotating around a massive singularity that has already begun to drift toward other great masses. The surrounding space becomes progressively emptier as galactic matter is consumed by black holes that merge in a massive central singularity; creating a focal point for other singularities to home in on.

Black holes have a Schwarzschild radius (event horizon) in which matter entering cannot escape[22]. The radius is proportional to mass and for each solar mass equivalent it amounts to 2.95 kilometers[23]. 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 nearly 3 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 come into one another's grasp while still 6 billion light years apart. Their double-bubble event horizon will continue to draw in strings of material from beyond its periphery and ultimately becomes a spherical event horizon with a 6 billion light year radius.

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 nearly the same speed as the collision[24].

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[25]." Singularities at absolute zero would seem to substantiate this assumption that mass and energy are separable entities.

For simplicity, assume our colliding singularities have equal mass and—being at absolute zero—each has a rest energy of zero. When gravity draws them together their kinetic energies each become: $E=\frac{1}{2} mv^2$. As they reach collision speed, c, each has a kinetic energy $E=\frac{1}{2} mc^2$. And summing their collision energies yields: $E=mc^2$, the big bang's total system energy. This implies that the force of gravity is transformable into all other energy forms.

In this model gravity sparks *all* of the heat, pressure, electrostatic, and electrodynamic energy forms when it bashes singularities together to create big bangs. Gravity also quiesces 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 subdues their motion and quenches their heat by crushing them into neutron stars and black holes, often skipping the neutron star phase. This constant crushing process generates a continuous stream of outward flowing heat in the form of photons and electromagnetic energy.

The collision pulverizes the black hole masses and 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. Forces in their Schwarzschild radii crushed 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.

6. 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.

7. Matter/antimatter disparity

One unanswered question the Standard model has is: why does the observed universe contain 100,000 times more matter than antimatter[26]? 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 a belief that the big bang's mass was spawned from nothingness and nothingness needs to generate matter and antimatter in equal quantities. This has always left me scratching my head, as I knew that matter and antimatter carried opposite charges, but could never imagine how antimatter might have a negative mass.

Our big bash didn't take place in a spatial null, but occurred in a preexisting universe that imparts its own biases. If the singularities involved in our bash were not 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 Inflation 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 is a steady state universe having far more mass than our big bang and it may cycle endlessly.

8. 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 10,000[27]? 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.

Our colliding singularities were each equally cold when they *also* came into intimate contact before pancaking and giving its expanding matter a uniform starting temperature; so 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 rule out Stephen Hawking's notion that black holes will ever evaporate.

9. 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.

10. 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[28]." 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 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[29]. 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 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.

11. 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 littered with debris, new gas clouds find plenty of old cold objects from which to seed new stars.

12. 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[30]. 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[31].

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[32]. 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 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[33]. Their quantity seems to have peaked less than a billion years after the big bang, yet there's been a steady decline in their population over the past 10 billion years[34].

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 [35]. 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"[36][37][38][39][40][41][42].

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"[43].

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 do not co-move with their galaxies because they are ancient black holes being overrun by 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.

13. 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 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.

14. 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 [44]. 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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