The Big Bash Alternative Model of the Universe

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Abstract

Cosmologists continue to discover anomalies which are not congruent with the currently accepted standard model of the universe. The Inflationary Model asserts that the big bang marked the creation of the universe; yet, scientists are finding cosmological structures that appear to be much older than the big bang.

The author posits that the evidence points to a much older, larger, and more internally dynamic universe in which our big bang was but a local event. This new model describes a steady-state universe wherein gravity is the prime mover and big bangs are not initiated by smoothly inflating singularities, but rather result from the light-speed collisions of ultra-massive black holes. This model does not require any unproven fundamentals of physics nor does it tax our scientific sensibilities. It is based on the assumption that the big bang did *not* clarion the beginning of the universe.

Keywords: Big Bash Model, Steady-State Model, Inflationary Universe Model, Big Bang, Gravity.

The objective of *The Inflationary Universe Model* of the Big Bang is "To determine the evolution of the universe ..." [1] While it is not unreasonable to assume the big bang marked the birth of the universe; that assumption is, nonetheless, arbitrary and cosmologists find increasingly more evidence that the universe is much older than the big bang. [2, 3, 4] In fact, there is no compelling evidence to support a belief that the big bang either marked the beginning of time or established the birth of the universe.

Inflation's machinery performs fairly well on a quantum scale, but falters when explaining data garnered at cosmic scales. Many researchers would prefer a more natural three dimensional space model who's observed behavior can be made coherent and cohesive without a need to summon the influences of external universes or unverifiable dimensions.

Cosmologists around the world have spent 80 years studying the expansion evidence of the big bang. They've continuously recalibrated and refined their measurements until they pretty much agree that the expansion began some 13.75 billion years ago. In the process though, they encountered a number of large cosmic structures that appear to be many times older than the big bang.

In recent years they also found that the big bang's expansion is accelerating and it appears as though that acceleration may go on forever. [5] So, if the universe's three spatial dimensions were not already infinite, perhaps they will be now.

The Inflation Model appears to fit the cosmological evidence gathered prior to its inception. It extrapolates on events occurring since the big bang, but does not support events preceding that time. Inflation adopters came to accept that the big bang marked the birth of the universe and that its size and shape are mostly defined by the big bang's initial momentum and the subsequent behavior of external forces emanating from supernatural dimensions.

If we start with the assumption that the big bang *was* the beginning of the universe, our model would *need* a creation story. Inflation tells such a story, but that story has been tweaked to fit so many anomalies that it's now too convoluted and complex to pass the test of Occam's razor.

The Big Bash Model, presented here, asserts that the universe is made up of much more than a single big bang and that *our* big bang is but one example of many such grand scale phenomena that occur naturally in the three-dimensional confines of a gravitationally powered universe.

The mysterious force accelerating the big bang's expansion is now commonly known as dark energy. From within the big bang, dark energy behaves as though it is a negative form of gravity. So when dark energy modulates our big bang's expansion it results in a decelerating expansion caused by the gravitational pull of the big bang's own center of mass, then over billions of years it becomes a reaccelerating expansion caused by the dark energy.

The first ground rule I've applied to this new model is that all well-confirmed cosmological evidence must fit within the model without taxing the sensibilities of experimental physicists. The process begins with a foundation upon which dark energy's behavior can be viewed as a natural phenomenon.

The big bang's expansion has a velocity profile one might expect to see if our big bang were surrounded by other colossal masses that coexist in one common three-dimensional space. In this case, reaccelerating objects would be drawn toward huge masses that reside beyond the expanding perimeter of the big bang. The velocity of the reaccelerating masses is characterized in the following scenario.

If we shoot a cannonball to the earth from its moon, the moon's gravity will *decelerate* it until the earth's gravity becomes dominant, then the projectile will *reaccelerate* as it continues its journey to earth. If our view of the earth had been obstructed, the way big bang matter obstructs our view of more distant masses, we would get the sense our cannonball had encountered a negative gravity — the same sense we get when observing our big bang's expansion.

Thus, our new model is founded on the premise that our big bang is but a local phenomenon that took place in the context of a much older and vastly more massive universe. This model does not require the existence of negative gravity, nor does it require additional dimensions in order to explain other mysteries that are not consistent with the Inflation Model.

Next, we'll examine how our big bang would be expected to behave in the context of a larger and more natural universe.

Galactic superclusters are the most massive and gravitationally attractive objects we see from inside our big bang. These clusters will continue to grow in mass for as long as there are nearby cosmic objects they can attract and feed upon. If our big bang contained all of the universe's matter, then even the largest supercluster will grow to only a few tens of billionths of the mass of the big bang. Their radial trajectories are moving them outward from the big bang's center and therefore our groups of clusters are mostly moving away from one another. The big bang has no internal force that will ever pull these diverging clusters back together again.

Superclusters contain many thousands of black holes and other galactic star stuff. It's all merging and gravitationally compressing itself into fewer and ever more massive black holes. Eventually, each isolated supercluster will get rendered down to one massive black hole. But since *our* superclusters are *accelerating outward* from the big bang, it looks as though there is plenty of additional mass out there to support their continued growth. Our *expanded* universe would have relatively unlimited quantities of matter and superclusters would be free to grow for as long as they can find nearby masses to feed on.

Black holes squeeze captured atomic particles until they collapse and can no longer move. In the process a black hole's heat also gets squeezed out.

In his book, *A Brief History of Time*, Stephen Hawking tells us that the more massive a black hole becomes, the lower its temperature gets.[6] 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 goes on to say that a black hole will continue to absorb more mass than it will emit until the time the background microwave radiation's temperature drops below the temperature of the black hole. At that point the black hole will begin its virtual eternity, some 10^{60} years, of ultra slow evaporation.

If we had a black hole ten billion trillion times more massive than our sun, on the order of the mass that spawned our big bang, and it had a temperature near absolute zero, it seems it would be the most stable mass imaginable. That leads us to ask: what sort of natural force could possibly cause such an inert mass to blow itself to smithereens?

It's interesting to note that one mission of CERN's Large Hadron Collider is to smash heavy particles together at near light-speed in order to simulate a big bang. Well, ultra-massive black holes are pretty heavy particles. It seems that *gravity* would be the only natural force capable of applying enough energy to smash them. Our Big Bash Model will require *two* ultra-massive black holes in order to produce a big bang.

In this model gravity drives *all* of the universe's machinery. It sparks the formation of heat, pressure, and electromagnetic energy forms when it smashes black holes together and creates big bangs. Their residues are blown throughout the universe, intermixing and concocting an infinite array of environmental habitats. Gravity also quiesces these energy forms by regathering matter back into black holes. It squeezes heat out of atoms in the stars, where it forms ever more massive and ever less energetic elements. It finally subdues their motions and quenches their heat when it pulls them back in to cold black holes.

Eventually, a super-duper cluster will run low on adjacent matter to sweep up and its central black hole will consume most of the matter surrounding it. This creates a gravitational focal point for other naked black holes to home in on.

The product that determines gravity's accelerating force is: $(m_1 \times m_2)/d^2$, where m_1 and m_2 are the masses of the two black holes and d is the ever closing distance between them.

The product of the masses is huge and as their speeds approach the speed of light the mechanics of relativity tell us that their effective masses approach infinity. Gravity can handle this workload though, for as the distance between the black holes decreases gravity's accelerating force grows geometrically. So when the distance between colliding black holes decreases by a factor of a thousand, their accelerating force increases a million fold. And since the diameter of a singularity is thought to approach zero, gravity's force will approach infinity as the black holes pancake and begin to splatter.

Gravity is the most awesome supercollider imaginable and big bashes would be very natural phenomena when mass and space are plentiful. These bashes would come in numerous sizes and shapes, coexisting and comingling at all stages of their life cycles.

By its nature the Big Bash is a steady-state model of the universe. It seems that such a model would need to be many orders of magnitude larger than the extremities of our own big bang in order to cycle in perpetuity. For math modeling purposes it may be appropriate to start with a spherical universe many trillions of light-years in diameter and having millions of big bang masses. There may be no *upper* limit to the volume, mass, or age of this energetic and dynamic universe.

Implications of the Big Bash Model

Our local big bash would take the form of a big splat with a ball of hot plasma filling its central region, much like that of the inflationary model, except it would *not* be smoothly inflating nor would it create the existence of space — as space was already in place.

Black holes can be pregnant with the semi-digested galaxies of their last meal and can be more voluminous than naked singularities. So it seems they would not need inflationary preconditioning to be suitable progenitors for *our* big bang. And since the rest of the universe existed before the occurrence of the big bang, it seems that our local big bang would not need any inflationary force other than its collision generated explosion.

The collision would also generate an electromagnetic pulse that becomes an expanding bubble enclosing all the chaotic matter frothing within. It's conceivable this expanding magnetic bubble would exhibit the sort of boundary characteristic we interpret as the expansion of space.

As the bubble grows its shape gets distorted by merging with other big bang bubbles and magnetic fields. This mixture of plasmas and electromagnetic fields becomes the "ether" that engulfs cosmic bodies and imparts dynamo-like forces on them. Could it be this electromagnetic torque that accounts for some of the "missing dark matter" that appears to cause galactic rotations to be driven from their outer extremities?

It would also seem that elongated electromagnetic fields may be responsible for aligning galaxies into rivers, the way induced magnetism aligns and clusters the non-magnetized iron filings we use to reveal fields surrounding magnets.

When the colliding black holes shatter, their smaller chunks would no longer have sufficient mass to overcome the intense heat, causing the black hole fragments to inflate the way that Inflation's singularity inflates. The mass of bubbling froth and exploding popcorn would help create the sort of thermal footprint we see in the Cosmic Microwave Background. Such gravitational irregularities would foster the clumping of matter into a broad diversity of gaseous clouds.

This chaotic crucible of cosmic componentry is stirred by its turbulence and seasoned with the broad range of spins, densities, and pressures necessary to brew a stew of light and heavy atoms, great and small black holes, and the full spectrum of other wonders we see in the analytical feast set before us.

As the splat and its central plasma ball expand, their leading edges overrun leftover debris from earlier bangs. Smaller masses seed the early growth of stars while black holes seed the early formation of galaxies. This prospect opens the door for many new speculations and hypotheses in need of additional analysis.

It's not difficult to imagine rivers of galaxies from older bashes passing across the bow of our bash's expanding wave front. As the wave passes it leaves huge deposits of new matter on the foreign galaxies, engulfs them in our new system, and forms a series of "Great Wall" structures. In their shadows we would expect to find great voids. It will be interesting to see if we can pair some of these structures.

As the plasma expands, cools, and thins, external bodies that impinge on our new system would mostly remain intact and show up as red or blue shifted objects that are out of character with their surroundings.

The genesis of early galaxies, quasars, reionization, etc.

A universe whose modus operandi is to continuously bash large and small objects together would be thoroughly littered with debris, like the debris we find in our own cosmic neighborhood.

The mixing of newer big bangs with older ones will aggregate a set of conglomerates that would be deemed anomalous in an isolated big bang. For instance: If a dense rotational gas cloud from our big bang were left on its own, it may take hundreds of millions, and perhaps billions, of years for gravity to overcome the centrifugal force of the cloud and to form stars and heavier bodies. However, when the same rotating cloud overruns extraneous comets, asteroids, and other debris from earlier systems, the formation of stars will occur quite rapidly. And since the transiting bodies are foreign to these centrifugal systems the rotating gas will collide with them at higher rates than if these objects were part of the rotational system.

If a foreign *black hole* were to transect a dense rotating gas cloud; instead of orbiting the black hole the flowing gas would stream directly to it and matter would accrete at a phenomenal rate. Enormous quantities of heat would be liberated in a short period and the black hole would light up like a quasar. The relative motion of the quasar might propel it completely through the gas cloud and on to other great masses, or it may oscillate through the cloud's gravitational center and settle in as its central black hole. It seems that an oscillating black hole would drag a lot of gas along with it and that the stream might reshape a rotating dust cloud into a barred spiral galaxy.

Once the now massive black hole begins to settle at the center of the cloud, the young galaxy's shape will largely be determined by the amplitude of the black hole's prior oscillations. A short oscillation would create a simple spiral galaxy while progressively longer oscillations will create the whole spectrum of barred spiral galaxies. After the black hole settles in to the galactic center, it becomes part of the centrifugal system. The rate of accretion would slow considerably and the quasar soon dims.

A big bash's expanding cloud is constantly overrunning significant chunks of solid foreign matter. As soon as the cloud cools sufficiently to stop vaporizing that matter, these objects would begin to accrete prodigiously. Quasar-like bodies would form by the billions. Their masses would add texture to the local cosmic background and their energetic radiation would reionize cosmic gasses. They would also begin the spawning of galaxies.

The outermost points of our big bang's splat may contain massive chunks that were not annihilated by the bash's great central heat. It would seem that this dense matter might become the sort of great attractors we find within our big bang. Other great attractors may have originated from external masses that are currently positioned either within or beyond the bounds of our expanding system.

If our super three-dimensional universe is finite in size and has shape, it would be relatively spherical and would be held together by its own gravitational mass. Its outer boundaries would be elastic and progressively more vacuous. Beyond this edge there would be no major gravitational attraction, so objects flung into this void will eventually decelerate and return to the fold, as this unitary universe would have no escape velocity, for there would be nothing to escape to.

All matter is gravitationally aware of all other matter and massive bodies are continuously sweeping up much of what they encounter. Matter not gathered will often be flung into distant reaches. Cosmic clusters become more massive while the interceding voids are becoming more rarefied. This cleansing continues until an adjacent bash again contaminates the vacated spaces. It would seem that all large spaces would be contaminated with cosmic debris and thereby any large gas clouds would find plenty of seeds from which to grow stars.

Remnants of older bashes get scattered throughout the universe and are homogenized with the matter of other bashes. This provides the infinity of molecular probabilities needed to support life. These precious molecules are gathered, nursed, and dispersed to the planets by the soft watery comets that are ubiquitous and highly mobile throughout the universe.

If cosmological constants, such as the Planck constant or the speed of light, have variability; one might expect such variability to be unique to each big bang and perhaps be due to differences in mass and final closing speeds of each bash's colliding bodies, as well as the lapsed time and loss of system energy since those collisions occurred. Even if the constants from separate bashes actually *are* constant, observers from one system may note differences in another system due to relative motions. That is to say, impingement of two big bangs may create relative velocity domains such that observations of one system from a perch in the other system may yield measurements that suggest a difference in the values that, in fact, are only due to relative motions of the two expanding systems.

The fine structure constant, commonly referred to as alpha, constitutes calculations involving the elementary charge, the Planck constant, the speed of light, the magnetic permittivity of free space, and the Coulomb constant. Its possible variability is currently under investigation by international teams of scientists. [7] These observers detect what appears to be a tiny variability in the fine structure constant that increases progressively across a broad expanse of sky. The spectrum of variations seems to be fully contained within a single lobe of space that exists in a specific region of the sky.

It would seem that the region of space containing this phenomenon would be consistent with the overlapping domains of our big bang and that of another big bang and may lend some credence to the Big Bash Model.

The model not only provides coherence and cohesiveness for the plethora of evidence scientists have already gathered, it also holds predictability for future discoveries.

As continuously improving instruments let us see further out through deep field peepholes, we should expect to find a number of distant blue-shifted objects peering back at us. We would also expect to see external bodies moving laterally across those peepholes. We may even be able to detect rare electromagnetic pulses from collisions that occurred far beyond our own big bang.

The mixing of matter from multiple bashes will yield phenomena that would be described as anomalous to the Inflation Model, but will make more sense when viewed in the context of a more energetic natural model.

I'd like to note that the high resolution James Webb Space Telescope, slated for launch around 2014, is designed to work primarily in the infrared spectrum, so as to give us a better handle on distant red-shifted galaxies. Hopefully, it will also be given *some* capacity to detect distant *blue-shifted* objects.

We have a lot to learn from the universe's ethereal magnetosphere. That medium not only brings us radiative *information* from across vast distances, it may also provide the *electromotive force* that determines the alignments and rotational characteristics of galaxies. We should find it enlightening to map the continuities of plasma fields and to calculate the flux paths between, around, and through cosmic bodies. It seems this would also provide much enlightenment about the behavior of gravity.

The world has a large community of well connected mathematicians and physicists who are enthusiastic about computing the predictive dynamics of the cosmos. We should find it productive to support them in mastering, expanding upon, and consolidating the electromagnetic worlds of Maxwell and Einstein. These giants would have loved the computation, observation, exploration, and communication tools we are continuing to evolve.

Summary

The Big Bash is a steady state model of the universe that is powered from *within* by gravity. Its black holes act as entropy's rechargeable batteries and its anthropic conditions become very high probabilities when nature can roll its dice, gather them up and roll them again for as long it takes to come up with life's lucky numbers.

Its many differently sized and shaped splats impinge upon one another in the way that Set Theory's spheres overlap to create unique domains. Each domain would have its own set of Cosmic Microwave Background peculiarities.

It will take a while to sort all of our currently anomalous findings and assign them their proper domains. And since each domain has its own expanding wave front, this grander universe should provide a fascinating degree of predictability. It will take far more work to back-track this complex system and explore its beginnings than it took for us to rewind and examine our relatively simple big bang.

In contrast to the one-bang Inflationary Universe Model, its bashes don't need an early inflationary stage, are violently explosive, and exhibit pre and post-bang characteristics that do not include the mathematical infinities that tax the integrity of general relativity. While the Big Bash *does* provide a source for our big bang's genesis, it *does not* attempt to explain the creation of the universe. That work will have to wait until we can see what the bigger universe looks like.

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