Mini Big Bangs

By Clark M. Thomas

Abstract

We all have heard of big bangs (or The Big Bang). Who in experimental physics has examined small big bangs beyond puny particle colliders with their micro results? Until recently relevant cosmological imagery was not available to help science explain mini versions. Awesome data is just now available to support understanding within our local universe, and beyond.

Only since the past century has the idea of universe-creating, non-point big bangs been taken seriously. Previously, the idea of our steady state cosmos was paramount. New astronomical data has arrived that invites discussion of *at least one or two mini big bangs (MBBs) inside our local universe's expanding volume.*

Ironically, all the physics within the 4D multiverse has yielded an elegant multiverse that superficially appears somewhat like the prematurely discarded steady state paradigm for our own local universe, which alone is not steady state.**[1]** One core aspect of 21st-century physics is the elegant model of *net push/ shadow gravity*, originated in primitive form in the late 17th century, and prematurely discarded in the late 19th century. This real granular gravity model is essential for understanding all big bangs.

The 20th-century idea of quantum seas is a rough model for *part of what we can never instrumentally measure* of tiny real yin/yang foundational spheres, including dark matter/energy.

Early big-bang paradigms seemed to challenge ideas of the steady state universe. Having *just one big bang for everything* requires an original and previous "creative" force. It implies some sort of designing, non steady-state "eternal" god beyond time's cause and effect. The omnipotent, eternal god hypothesis is thus a weird aspect of steady state totality.

The divine origin idea is perhaps possible for any one creative big bang, if we look at it with tunnel vision. However, there is no solution beyond *absurd infinite regression* for all possible local divine big bangs within the physical 4D multiverse, and indeed for the origin of any or all creative gods. The *principle of parsimony* demands physics elegance, which is the essence of the emerging 21st century cohesive creative paradigm.

It may seem odd that any "mini" BB (MBB) feature inside our local 4D visible universe could support strong congruence with the overall real-physics 4D multiverse. Within a proper relative perspective MBBs are thus more normal than abnormal.

Preceding this essay I published an original thesis explaining the critical differences between ordinary black holes and black holes that are candidates for becoming another big-bang local universe of any size. It is essential that you understand the preceding essay as foundational for this essay **[2]**

Various Types of Mini BBs

Outside the too-tidy paradigm of only one seminal big bang, there are other inspirations for what I call mini big bangs:

FIRST, there is only one experimental physics model that has been tested involving the possibility of a mini BB. That involves

using the power of linear particle accelerators, most notably the CERN Large Hadron Collider, to create a micro black hole (micro BH). For awhile it had been feared that a micro BH could grow in mass and size to where it sucked in everything. This fanciful idea of micro "gravity meals" (ignoring Hawking radiation) became physics jokes in both recent TV series involving the fictional Sheldon Cooper and his physicist friends.

Our visible local universe floats within the overall multiverse. The reason for experimental inability to create mini black holes involves the type of accelerated particles they used, typically *protons, which are about twenty linear dimensions of ten larger than individual foundational y/y spheres.* Fortunately, existing and future particle accelerators will simply be far too puny to disrupt any foundational Coulombic y/y spherical cohesion.

SECOND, there are lesser BB explosions in our visible universe that are nevertheless immense – but not sufficiently immense to create whole new local universes, or even to disrupt the cohesive multiverse. These "mini" explosions (MBBs) leave dissipating evidence for billions of years that we astronomers can today examine, thanks to the limited speed of photons. Astronomy is thereby a unique "time machine" to the past for all BB theorists.

Whereas supernovas are the most spectacular examples of stellar implosion, there are also other things to behold, such as novas and neutron stars. None of them, including supernova explosions, yields the potency of BBs, primarily due to total mass.

I have written about some of these phenomena: One story involves the puzzling Arp's loop.**[3]** That is a curved line over part of the impressive M81 spiral galaxy near the M82 galaxy. This visual pair is very popular among amateur astronomers. One hypothesis in the physics community had been that nearby M82's gravity ripped apart some of M81's galactic plane.

A collaboration of six astrophysicists from two universities seriously examined this visual mystery with their equipment.

They discovered that the so-called Arp's loop is a line-of-sight gap illusion involving a superimposed nova arc remnant within "galactic cirrus" hovering over our Milky Way galaxy.**[4]** Their detailed work was totally unknown to me when I looked at the puzzle from scratch, and solved it in five minutes.

Whereas their collaboration did well, they only caught this one small "cosmic fish," not also the large fish. I saw independently that the "cosmic large fish" constitute a greater phenomenon of multiple smoke-ring-like remnants from basic *stellar-scale* nova explosions scattered within the cirrus layer of galactic supernova dust remnants above our MW galactic plane. Thus, Arp's Loop represents one type of superimposition coincidence.

Less mature than ethereal cosmic smoke rings, nova compact remnants are documented in such objects as the famous Ring Nebula (Messier 57); or even in the real Star of Bethlehem (NGC 1514), another nova remnant discovery of mine.**[5]**

Ghostly rings from lesser explosions are one window toward understanding how mini big bangs on much larger scales can help populate "empty" space. MBB shock waves push together widely dispersed random particles, both dark and baryonic, yielding some large "objects" with gravity that our cameras can catch.

Nova rings dissipate over thousands or millions of years. MBB shock waves create with waves much more lasting rings of large galaxies that we see today from billions of light yeas in the past. Therefore, mini BBs are essentially more like full-scale BBs, even while they share some similarities with much smaller stellar rings.

More interesting phenomena could be added to this exotic list. Foremost are quasars and neutron stars: *Quasars* are essentially very active galactic cores within relatively young galaxies, and are commonly seen at great cosmic distances.**[6]** *Neutron stars* are collapsed supernovae that didn't have enough mass to further collapse into black holes with event-horizons – but they do have enough compression for rapidly spinning neutron cores.

The important lesson to take away from all of these alternative models for mini big bangs is that none of them could populate the larger volume of real "mini" big bangs. No exploding large star could release enough energy into a volume of billions of cubic light years of "empty" space to yield multiple entire 4D galaxies. Briefly, supernovas cannot create multiple large old galaxies of hundreds of billions of stars, in ring formations. We must look to the obvious elsewhere to find both the engines of mini big bangs, and immense big bangs that create the likes of our local visible universe.

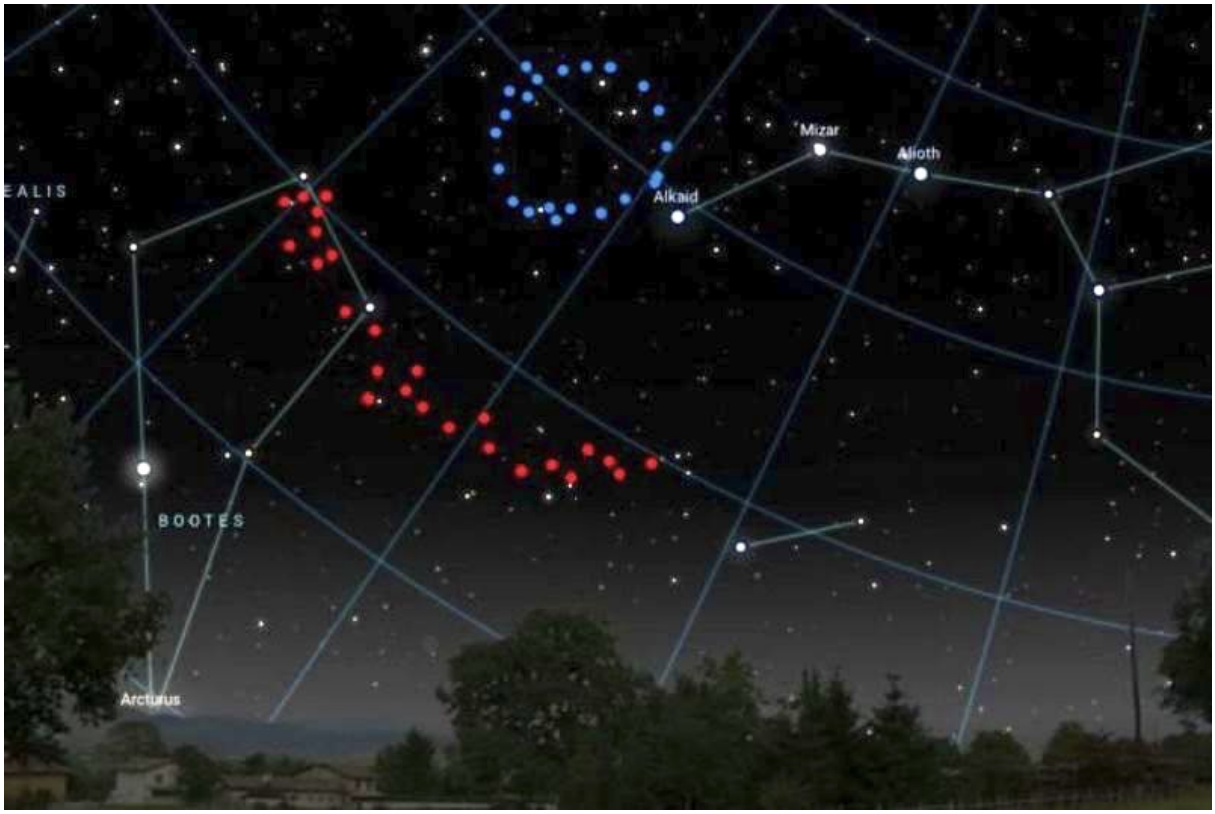
How Mini BBs Fit Into the Mix

We have looked at various candidates for possible mini big bangs, if they exist. Should they apparently exist, there is the critical question of *how much hyper energy is needed* beyond supernova levels to populate immense volumes. Whereas the exact critical matter/energy equation for any BB is not yet calculated, we can still envision how such a distinction works.

We start by looking for possible visible evidence of MBBs. If compelling astronomical data were not yet available, even with the James Webb Space Telescope (JWST), then any MBB quest would be, for now, theoretical and more difficult. Fortunately, there are two visually proximal regions of the deep cosmos that have yielded compelling evidence for likely post-MBB regions.

The composite visual of the Big Ring and the Great Arc **[7]** involves an amazing (blue here) "ring" of mature galaxies near the tail of the Big Dipper far larger than anything else of ring-like nature that we know of. The second structure (red here) of a great arc is an apparent region of another partial ring of mature spiral galaxies of possibly larger size. What we are seeing in our visual is an artist's impression of these deep sky structures.

This [#7] linked URL also mentions some theoretical ideas that have been advanced to explain what cannot be easily explained.



For example, Roger Penrose's idea is known as *conformal cyclic cosmology (CCC)*. It is hardly supported by any evidence, nor could it ever be within established physics paradigms.

Two other possibilities mentioned in link [#7] envision these structures as a type of "topological defect" in the fabric of space-time known as cosmic strings. Cosmic 2D strings and mature 4D galaxies are an odd combination at best.

A third possibility mentioned with the first two herein is an odd variant of the string theory model, imagining proton-sized wrinkles in spacetime, whatever that is.

All of the solutions proposed so far are not even close to being solutions. Standard cosmology cannot overcome its antique view of the greater cosmos, comprising mostly our universe. That's why this embracing essay exists.

According to the Wikipedia article on the Big Ring **[8]:**

> "The Big Ring is composed of numerous galaxies and galaxy clusters that form a continuous, almost perfect ring-like pattern in space. With its diameter of 1.3 billion light years and a circumference of 4 billion light years, it is one of the largest known structures within the observable universe. The structure is made up of many galaxy clusters and galaxies of various types. Some regions of the ring are denser than others, indicating variations in the mass and number of galaxies present. It exceeds the theoretical size limit of cosmic formations, which is calculated to be 1.2 billion light-years. This was previously thought to be impossible, as there wasn't enough time to be had for such a large structure to form."

A more elegant, and therefore superior, model of what is behind these mysterious gigantic structures is found in the previously cited link [#2] above, which I have recently written. Within this new model there is a coherent updated idea of gravity not bound by weird sheets. *It is also scalable according to black hole core mass, so that what does happen within massive big bangs also happens on a lesser scale among mini big bangs.*

The entire volume within the expanding visible universe is vast. More important, space is not a void. Quantum theorists say that so-called empty space is filled with quanta, however defined. That is so, but *the real quanta are yin/yang spherical Coulombic spheres and their short "dark mater/energy" beaded strings.*

Evidence presented by the *Great Arc* points to "empty space" near that particular local MBB as being densely populated with matter and energy, helping shock waves launch entire galaxies forming a ring.

Other universal areas within this arc are less dense, essentially patchy, and they tend not to produce whole galaxies completing a

ring. Thus, both initial energy from relatively less massive exploding black holes PLUS the radially adjacent distribution of matter/energy as quasi-quanta, all yield either spheres or rings or arcs, or nothing of note. Such resultant composite structures are many billions of years old, but still within our older Big Bang volume. Here is a very comprehensive model devoid of voodoo.

Continuing with the question of volume and quality of space, we have been offered problematical topological defects, and wrinkles within spacetime. These are the best antique solutions that Nobel astrophysicists such as Penrose can come up with.

Rings vs. Spheres

An obvious question arises: Why do our instruments reveal MBB rings and arcs, not virtual spheres of scattered galaxies?

We in our local "bubble universe" have almost magically been given what looks like a spherical local BB universe, according to the Cosmic Microwave Background. Homogeneity of expansion in all directions may be a common aspect of most truly massive BBs, but maybe not so often among the more numerous MBBs. This difference could be because supermassive BH cores may be more nearly spherical than smaller-mass mini black hole cores.

All core explosions only erupt after gravitational cascading inward *from at least one direction* before there is the much more rapid chain explosion outward. There is no rule that requires all explosive symmetries to be along radial core lines. Indeed, the images we have, from giant rings to giant arcs, points to common vector varieties from different escaping energy streams.

It is easy to envision an arc which curves along one broad direction away from the initial region of its MBB. There is no law in physics that requires the totality of space to be homogeneous. Pure in-space diffusion would seemingly point that way. However,

directionally different gravity and magnetic flows on the smallest and largest scales will bend ideal spherical diffusion to reality.

It seems fortuitous to envision beautiful rings several billion light years in diameter, with mature galaxies. Indeed, the image in this essay has both a ring of galaxies, and an arc. Based on this incredibly small sample size, it could be that nicely spherical MBB sub-local universes are the rare exception, not the rule. Here's a likely statistical case where *4D asymmetry* with galaxy ring units may be more common than *4D symmetry* inside large local BB universes.

I furthermore hypothesize that pre-MBB black-hole cores spin moderately, but not wildly. Collapsed neutron star cores are famous for having very high spin rates. The early Schwarzschild radius model assumes non-spinning black holes, but that is probably not too common, as some BH core spin seems normal.

Consider the type of holiday fireworks that spin brightly. This non-radial process likely works too at the level of huge mini BBs. There could also be more nearly spherical MBB explosions, and thereby we may not then so easily detect a giant ring or arc.

We may model that the initial cascading blast within a seminal MBB black hole is usually radial, but that is not necessary. Even if the initial blast stream starts out nearly radial, there is a high likelihood that an asymmetric phase could quickly emerge in a way that spins the total blast. Such *spinning could eject pushing wave energy that results in spewing a Big Ring of galaxies like the one we detect today.*

Key Comparison of BBs vs. Mini BBs

Just what is it about supermassive BHs forming BBs rarely, even though they have extremely massive "singularities" at their core? Especially in the early era of our local universe, there were many very massive black holes, but only the earlier massive BB.

In contrast, mini big bangs seem more common in our local universe, though still rare. By definition, a mini big bang remains within its parental big bang universe – unless the parent BB universe has dissipated to where there is enough space in the "*multiversal bubble bath*" to insert a separate new universe.

As you read my previous essay, you will notice that *size and mass alone are not indicators for which black holes may erupt*. The key resides with the random spirit of y/y quantum energy:

At the smallest real dimensions *two forces share the power*: The *first* may appear to be Newton's inverse force gravity, but it's really net push/shadow gravity, with inverse math. The *second* is the inverse relationships among *y/y spheres' virtual shells with very great Coulombic cohesion*, retaining the integrity of each bead-like matter/energy powerhouse. For a successful new BB to erupt, at least one or a few y/y spheres must be overcome by incoming columns of multiversal net "gravity" pressures.

As long as a great BH avoids being compressed to where y/y *quantum-like motions are quelled anywhere therein*, the critical distances between and among its y/y particles will not be close enough for a new BB to erupt from collapsing Coulombic spheres.

On the other hand, if and when the innermost spheres are so compressed that they are stacked together tightly AND there is insufficient *quantum-like pushback, that's when a new BB (or MBB) explosive cascade begins*.

The mere presence of a supermassive black hole is not the critical element for potential new big bangs. It is the absence of sufficient quantum-scale random motion pushbacks. Therefore, *a relatively modest black hole could spawn a mini big bang under the right compression conditions – even while not having enough total mass/energy to create its own large local universe.*

In sum, the physics of big bangs of all sizes are precisely related to the relative levels of compression and suppression of

intrinsic quantum-scale random motions. It is not just a black hole's total mass, but the *energy qualities therein* that count. Given suppressed random activity, a *stellar black hole could create a micro big bang,* while still not having enough *expansion energy* to create something intermediate like a real mini big bang within our visible universe.

The most simple things are the most complex.
The most complex things are the most simple.
Life is in between.

References

[1] https://astronomy-links.net/beyond.the.multiverse.pdf

[2] https://astronomy-links.net/BB.BHs.pdf

[3] https://astronomy-links.net/arpsloop.html

[4] http://arxiv.org/pdf/1004.1610v2

[5] https://astronomy-links.net/star.of.bethlehem.html

[6] https://astronomy-links.net/quasars.view.pdf

[7] https://www.indy100.com/science-tech/big-ring-giant-structures-universe

[8] https://en.wikipedia.org/wiki/Big_Ring