Cosmology in Crisis?

Ken Gonder*
Unaffiliated Independent
(Prepared for viXra.org open-access repository 1/20/2024)

Abstract

The recent discrepancy in the measurements of the Hubble Constant (the universe's rate of expansion) between the indirect, early method (+/- 67km/s/megaparsec) and the direct, late method (+/- 72km/s/megaparsec) has been characterized as a growing crisis for cosmology. To some, a transitory disagreement of less than 10% may not seem like that much of a concern. What would cause a real crisis though is if it were suddenly realized, factually established, and conclusively confirmed that universal expansion itself is conceptually impossible for a finite, uniform cosmos. Despite all of the obvious invalidating incongruities, universal expansion's fundamental viability is rarely questioned, if at all.

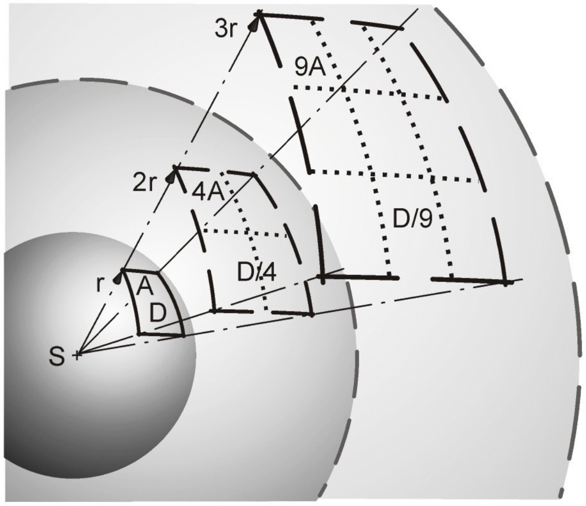
Contents

Abstract ____ **1**
Inquiry ____ **2**
Conclusion ____ **24**
Declarations ____ **26**
References ____ **26**
Bibliography ____ **27**

* kgonder0@gmail.com

Inquiry

How can our big bang universe remain uniform, homogeneous and isotropic as we observe, if it's expanding? Wouldn't the inverse square law, a basic principle of (three-dimensional) spherical geometry, cause its density to be diffusing exponentially, decreasing inversely as the square of the distance from its origin? Given its "innate" finiteness, how could it not? (I or D $1/r^2$: intensity, I, at the surface of a sphere, which is the same as density, D, is proportional to the inverse of the square of its radius [1]. Use **[Alt][←]** to return.) (See **Figure 1**, Inverse Square Law, Sphere - next page)



1. SPHERE'S SURFACE AREA & DENSITY
INTENSITY OR DENSITY OF AN EXPANDING SPHERE'S SURFACE AREA, D α (IS PROPORTIONAL TO) $1/r^2$

INVERSE SQUARE LAW, SPHERE

The surface area of a sphere is $A = 4\pi r^2$. It increases exponentially as it expands. When twice the radius from its center, its area increases four times. Three times the distance, nine times, and so on.

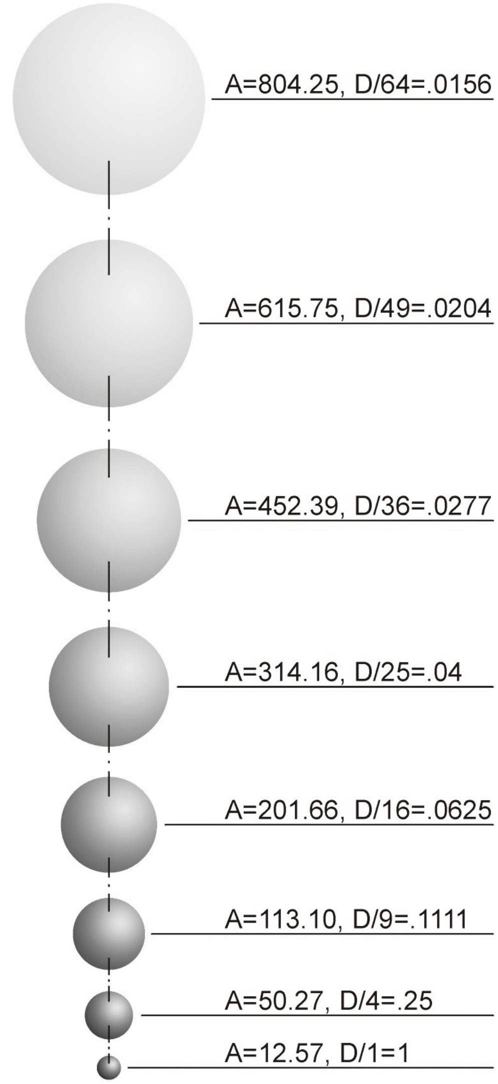
So the intensity or density (they're the same thing) of any assumed flux (a quantity at the surface) will dissipate exponentially following the inverse square law where D (the density at a chosen radius) = S (the original source density) / $4\pi r^2$ (the area of a sphere). So its density twice the radius from its center will be one-fourth its original. Three times the radius, one-ninth, and so on, indicated in diagram **1**.

This same principle would have to apply to our big bang universe that's assumed to be finite and expanding. The material at each consecutive radius throughout its interior would be simultaneously diffusing exponentially per the inverse square law, as represented graphically and qualified numerically in diagram **2**.

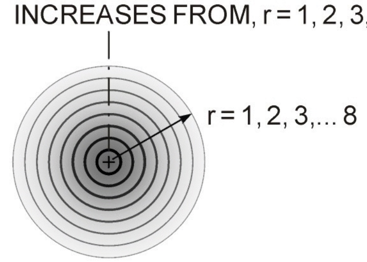
But we observe a homogeneous and isotropic universe. So it can't be finite, or expanding. This simple indisputable fact of three-dimensional spherical geometry by itself completely undermines the big bang.

To preserve it, we've employed Einstein's belief that it actually expresses two-dimensionally, like a sphere's surface. Its homogeneousness is maintained by confining galaxies to the surface of a spherical universe that can then dissipate uniformly with expansion. But there's no existence in two dimensions. So the big bang can't be real, which reduces it to nothing more than theoretical whimsy.

A more pragmatic direction would begin with an infinite (non-expanding) universe that suggested realistic alternatives for astronomical redshift.



LATERAL VIEW OF AN EXPANDING SPHERE DEPICTING THE EXPONENTIAL DIFFUSION THAT OCCURS AT EACH RADIUS INCREASES FROM, r = 1, 2, 3,... 8



SECTION VIEW THROUGH AN EXPANDING SPHERICAL VOLUME PORTRAYING THE EXPONENTIAL DIFFUSION THAT OCCURS AT EACH RADIUS SIMULTANEOUSLY AS IT INCREASES FROM, r = 1, 2, 3,... 8

2. SPHERICAL EXPANSION
SURFACE AREA: $A = 4\pi r^2$
SURFACE DENSITY: D α $1/r^2$

Figure 1

(7.1 Inverse Sq Sphere vi 13a)

Wouldn't that diffusion be easily discernible through the exponential dispersion of galaxies and their redshifts? Wouldn't their dispersion also reveal an origin's location, if one actually exists? If faster-than-light inflation occurred and created a visible horizon, wouldn't their dispersal still be perceivable and still indicate the origin's direction? If there's no diffusion, the universe cannot be expanding. And if it's not expanding, the big bang can't be real.

Even if it was somehow able to remain uniform, which isn't physically possible in three dimensions, expansion or not (see a tetrahedron, octahedron, and icosahedron, platonic shapes where the legs of uniformly distributed equilateral triangles around a sphere's surface are always longer than the sphere's radius [2]), but let's say it was, wouldn't its finiteness still be confirmed by a telltale pattern of galaxies that appeared to condense across the sky? Try to visualize what that would look like.

Let's assume that we didn't end up by chance at the universe's exact center but were located halfway between it and the perimeter. Wouldn't galaxies have to be arrayed two-dimensionally, condensing visually, not physically, over the entire sky into a single cluster that culminated in the direction of its center? From our vantage point, it'd be less dense in the direction where the perimeter is closest, one-quarter the total distance of its diameter, and more dense in the direction of its center, three-quarters its total diameter. Despite its uniformity, we'd still see a difference in the number of galaxies that proportionally was more than three to one.

Wouldn't the pattern have to be similar for an expanding universe that was diffusing? It'd just be more exaggerated. There'd be fewer galaxies in our outward-bound direction of travel where the perimeter was closest where they'd be more dispersed. And there'd be more galaxies in the opposite direction toward its origin, opposite our outward-bound direction of travel, where they'd be more condensed.

Wouldn't its expansion also be confirmed by cosmological redshift that correlated with the pattern? Wouldn't they have to be progressively increasing in magnitude, peaking directly opposite our direction of travel? Isn't that the direction where their distance would be the farthest and their recessional velocity/space's stretching would be the greatest?

Wouldn't this distinct pattern also clearly indicate the location of the universe's origin? And wouldn't the pattern's existence also decisively confirm the big bang? But wouldn't the opposite have to be true? If it doesn't exist then the universe cannot be finite. Nor can it be expanding. And again, the big bang, even if it were uniform, can't be real. (See **Figure 2** & **3**, Uniformity & Finiteness)

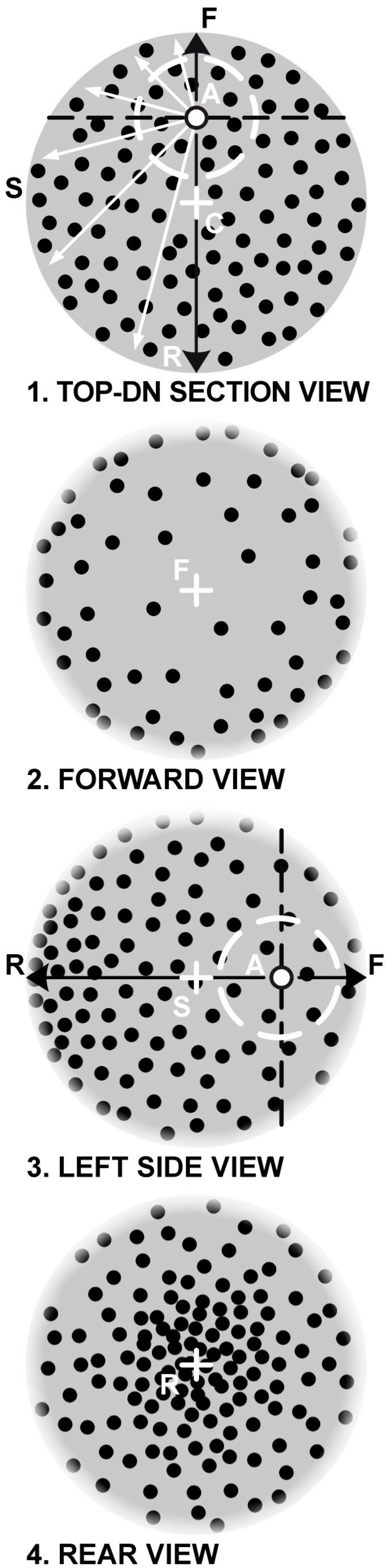


Figure 2

UNIFORMITY & FINITENESS

THE VISUAL DISTRIBUTION OF GALAXIES

Starting with the assumption that our universe is finite and it's expanding and that it can express uniformly, which isn't physically possible for a sphere in three dimensions. But for the sake of argument, let's assume it is because uniformity is what we observe.

If we also assume that we didn't end up by chance at the universe's exact center, but were located, for convenience, about halfway between the universe's center, **C**, and its expanding perimeter, **F**, at **A** in diagram **1** that portrays a top-down section view through our universe. We'd then see a two-dimensional array of galaxies that visually condensed across the entire sky, represented by the black dots beginning in diagram **2**, that was least dense in our forward outward-bound direction of travel toward **F** where the universe's perimeter would be closest. That's where the fewest number of galaxies would be.

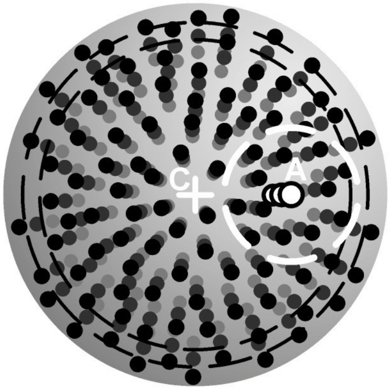
If we were to sweep around, as suggested by the sequence of smaller white arrows in diagram **1**, from **F**'s forward-looking view, diagram **2**, through **S**'s side view, diagram **3**, and look to our rear in the direction of **R**, diagram **4**, the visual two-dimensional density of galaxies across the sky would keep increasing, peaking exactly opposite our outward-bound direction of travel in the direction of **R** through the universe's origin at **C**, as depicted in diagram **4**. That's the direction where we'd find the greatest number of galaxies. We'd have to see this same visual pattern whether our (presumed) finite universe was diffusing or uniform or expanding or static.

If our universe was diffusing from expansion and condensing from gravity, as it'd have to be if it were actually finite because of a sphere's inherent geometry that's bound to the inverse square law, it'd still express the same visual array of galaxies across the sky. It'd just be more exaggerated, more dispersed in the forward direction, **F**, and more condensed in the rearward direction, **R**.

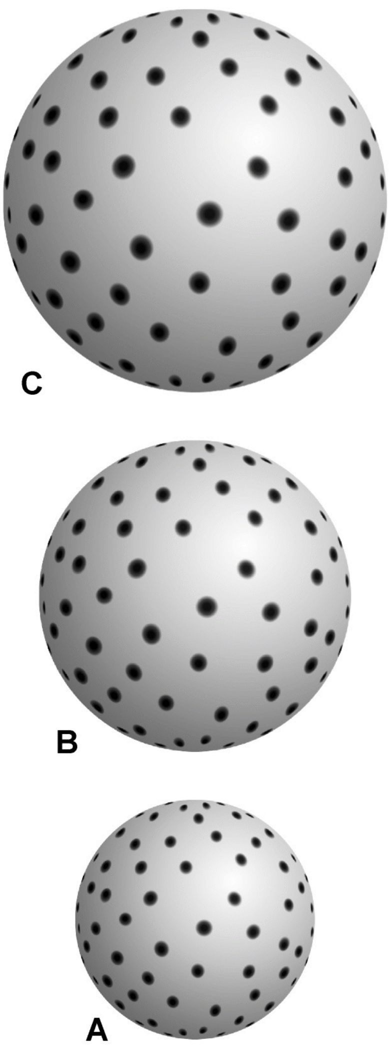
If we were to apply a cosmological redshift to galaxies from the universe's assumed stretching/expansion, whether it was diffusing or theoretically uniform, we'd get an exact correlation to the pattern. The highest redshift would be directly opposite our direction of travel where the galaxies would be at their farthest and densest and be receding the fastest. And the lowest redshift would be in front of us in the direction of our travel where the fewest, closest, slowest receding galaxies would be.

What we actually see though is a uniform isotropic/ homogeneous distribution of galaxies and their redshifts. This explicitly indicates an infinitely vast, ageless cosmos where cosmological redshift has to originate from a source other than universal stretching/expansion.

(50.1 Uniformity & Finiteness vi 9a)



5. RADIAL EXPANSION IN THREE DIMENSIONS



6. UNIFORM EXPANSION IN TWO DIMENSIONS

UNIFORMITY & FINITENESS - CONT.

THE RADIAL & UNIFORM EXPANSION OF GALAXIES

Arguing that there must exist a visible horizon that limits our view to a certain distance, indicated by the white dashed circle that represents a spherical region around our position at **A** in diagram **5** and **1** and **3** on the previous page, where all we can effectively see is uniformity doesn't work. Even if we ignore the interior diffusion that's inherent to a three-dimensional spherical volume, its expansion, or contraction, always has to occur radially. Its geometry is physically bound to the inverse square law's exponential diffusion, as portrayed in diagram **5**.

The volume of an expanding, or contracting, sphere can never express uniformly. And that diffusion would be easily perceivable whatever our location in our (presumed) finite universe. The only way to maintain its observed uniformity is to adopt Einstein's purely theoretical, curving non-Euclidean, finite yet somehow unbounded universe that with expansion has become the big bang.

It expresses two-dimensionally like the surface of a sphere, as depicted by the sequence **A**-**B**-**C** in diagram **6** that shows its galaxies' uniform dispersal with expansion. But there's no existence in two dimensions. Two dimensions can only define the location of a plane. So it doesn't work either.

No matter what we try, we're forced to return to an infinitely vast and ageless universe that requires practical, commonsense explanations for cosmological redshift and the cosmic microwave background radiation.

Figure 3

Gravity's coalescing effect on a finite universe would have it condensing exponentially. It could not remain uniform. It'd express the same visual pattern across the sky as diffusion. If condensing doesn't exist, it cannot be finite. Even Einstein realized this.

In his book, *Relativity: The Special and the General Theory*, he conjectures a curving, non-Euclidean (a geometry that's not straight, square, or parallel) universe that's "finite and yet unbounded" that expresses two-dimensionally like the surface of a sphere. Its spherical two-dimensionality would theoretically explain away its exponential condensing from gravity. (It would do the same for its exponential diffusion from expansion.)

He reasons that if gravity's effect were limited to the curving two-dimensional surface of a sphere, it would become uniform and could then be countered by employing a "cosmological term," a constant that would (mathematically) prevent the entire universe from collapsing in on itself [3]. He later abandoned his cosmological constant (that we've all heard he regarded as his biggest mistake) in favor of Alexander Friedmann's[1] idea of expanding space that he thought to be a more natural solution [4]. This is the essence of the big bang orthodoxy that we all embrace.

Two-dimensional space's counteracting uniform expansion would conceptually work in the theoretical realm of a sphere's two-dimensional surface, if a two-dimensional existence were actually possible. But how could three-dimensional space's expansion ever counteract gravity's exponential condensing in three dimensions? To produce a uniform result, wouldn't that require it to be decreasing exponentially from the universe's center out? How's that physically possible?

1. Russian mathematician, 1888-1925.

He justifies his two-dimensional, finite yet unbounded universe by adopting, "the three-dimensional spherical space which was discovered by [Bernhard] Riemann[2] [5]." It somehow melds our real three-dimensionality with a two-dimensional space that manifests as a sphere's surface. (Note how he references it as a "discovery" as if it had a factually verified physical existence and wasn't just unfounded theoretical speculation.)

He asserts that in his universe, someone can, "draw lines or stretch strings in all directions [meaning radially, spherically, in three dimensions] from a single point... At first, the straight lines which radiate from the starting point diverge farther and farther from one another, but later they approach each other, and finally they run together again at a 'counter-point' to the starting point. Under such conditions they have traversed the whole spherical space [6]."

This is so ludicrous it's laughable. But it's also somewhat sad. He apparently lacks the ability to discriminate between two and three dimensions. He first has the strings diverging three-dimensionally as if existing in our real environment, but then he has them somehow converging two-dimensionally. That's not even remotely possible. It's an inherently conflicted, physically impossible scenario that assumes existence in both two and three dimensions.

We foolishly affirm his "reasoning" by agreeing that someone with a powerful enough telescope could look out in any direction, three-dimensionally, and see the backside of our own galaxy, which is just as conflicted and just as impossible. But at the same time, we also hold that someone with a powerful enough telescope could look out, again in any direction radially in three dimensions, and see back in time almost to the universe's inception.

How could we see the universe's beginning when we're supposedly looking at the backside of our own galaxy? And how can we look out in any radial direction, three-dimensionally, and see the universe's inception? In three dimensions, it'd have to occur at a single location. It cannot be everywhere. That doesn't even work two-dimensionally.

2. German mathematician, 1826-1866.

Einstein asserts that imagining or visualizing his two-dimensional three-dimensional, "space means nothing else than that we imagine an epitome of our 'space' experience, *i.e.* of experience that we can have in the movement of 'rigid' bodies. In this sense we *can* imagine a spherical space [5]." Does any of this have a rational interpretation? Maybe it just needs to be deciphered for those of us limited by normal intelligence.

It certainly looks sophisticated and legitimate. But when all of its high-sounding technical rhetoric is filtered out and all of its illusive mathematical gimmickry is stripped away, aren't we ultimately still left existing in two dimensions? That doesn't work. Any way you cut it, genius or not, two dimensions can only define a location that's planar. It might maintain the big bang's uniformity, theoretically, but without the third dimension there is no actual existence.

Its finiteness is another issue. How can the universe even be considered limited, in any way, when by definition it's infinite? It includes everything. So if space is something that defines its shape and extent, wouldn't the space that's outside of it have to also be included? Einstein explains (paraphrasing), there would always be "unbounded empty space" outside of the universe's "bounded space [7]." By that reasoning, wouldn't a universe that's defined by space have to be inherently infinite?

But this raises another fundamental question. How can "space" determine the shape and size of the universe when it doesn't exist? By definition, it's the nothingness between objects. It is not a physical something. There's nothing there. So if it's nonexistent, how can it define the universe as finite?

Moreover, if it doesn't exist, how can it curve, expand, or stretch as it expands, or cause light's redshift as it stretches? And if its expression is limited to two dimensions, it again still wouldn't exist. So why wouldn't its intrinsic nonexistence, which nullifies its curving, expanding, stretching, and light's redshift from its stretching (in either two or three dimensions), be enough by itself to render the big bang a fallacy [8]?

A finite yet unbounded universe, no matter how it's rationalized, is an inconceivable reality that's even more absurd. And its inherent nonphysical two-dimensionality and impossible curvature, expansion, and stretching of a nonexistent space permanently relegate it to the theoretical realm anyway. So again, the big bang can't be real.

Unable to refute this elemental logic, some have devised an ad hoc workaround in an attempt to salvage it that theoretically would justify its uniformity. They retained its nonexistent space's expansion but abandoned its impossible two-dimensionality and finiteness. It's now a normal, three-dimensional, but infinite big bang. Without its finiteness, the inverse square law's invalidating diffusion would no longer be an issue.

But now that it's infinite, what's the impetus for its expansion? It has none. It's just expanding for no particular reason, and so is its increasing rate. At least a finite big bang could claim its condensed state as a potential catalyst for its initial eruption, ongoing expansion, and expansion's acceleration.

But don't all of the big bang's presumed primeval conditions arise from and are contingent on its finiteness? Size, density, pressure, temperature, the creation of cosmic microwave background radiation, matter's inception and maturation, universal expansion/condensing, universal self-gravity, the theorized big crunch, and so on, wouldn't they all become meaningless in an infinite reality? Sure they would. How can the universe begin smaller than the size of an atom but at the same time be infinitely vast? The whole notion is fundamentally ill-conceived. It's a nonstarter.

In 1949, Fred Hoyle[3] who coined the term "big bang" proposed along with others an alternative steady-state theory. It attempts to keep the density of an expanding infinite universe constant with the continual creation of new matter. This would occur in between galaxies, filling the enlarging void between them caused by universal expansion [9].

3. British astronomer, 1915-2001.

But the issue is not constant density, maintaining the same distance between galaxies as they move away from one another equally. It's uniform density, maintaining the universe's homogeneous isotropic properties from its center out as it expands. How would it ever be possible for a finite (three-dimensional) big bang, which would have to be subject to the principles of spherical geometry, to not diffuse as it expands?

Also, wouldn't the creation of new galaxies in between the existing cause all of the older galaxies to be surrounded by and nested within a spherical shell of younger galaxies? Wouldn't this produce an easily discernible three-dimensional polka dot pattern of older galaxies? But what's more important, universal expansion for an infinite universe is again fundamentally nonsensical.

Aside from lacking an impetus for all of its presumed conditions from expansion and expansion itself, if it's run backward, don't we quickly end up with an infinitely small universe that's still somehow infinitely vast? How can the distance between galaxies remain constant when it's infinitely small? It'd be larger than the entire universe. These unresolvable paradoxes make no sense, not that an expanding finite universe is that much more rational.

The creation of new matter for a finite (three-dimensional) big bang is another solution. But it's still unworkable. New material would have to spawn out of nothingness at its expanding perimeter. And it'd have to be increasing exponentially, coinciding with the inverse square law to exactly counter its diffusion to generate a homogeneous result.

Also, its exponential rate of creation would have to be increasing to match expansion's increasing rate. All this is highly improbable and problematic to say the least. The age of galaxies for example, the youngest would be at the universe's expanding perimeter while the older ones would remain near its center. So the whole idea is another nonstarter.

The bottom line is, if the universe is not diffusing and can't express two-dimensionally, the big bang has to be a fallacy and the Hubble Constant has to be a misinterpretation. So cosmological redshifts have to be indicative of something other than (nonexistent) space's stretching and cosmic microwave background radiation has to originate from a source other than the big bang's primordial conditions.

Why is it unreasonable that cosmic microwave background radiation might originate from a different source? It's just a theory, and it's based on the big bang at that. If the big bang never occurred, wouldn't it have to? Being that it corresponds to galaxies as they appear across the sky today, not where it would have been shortly after the big bang, why aren't galaxies themselves considered the most likely source?

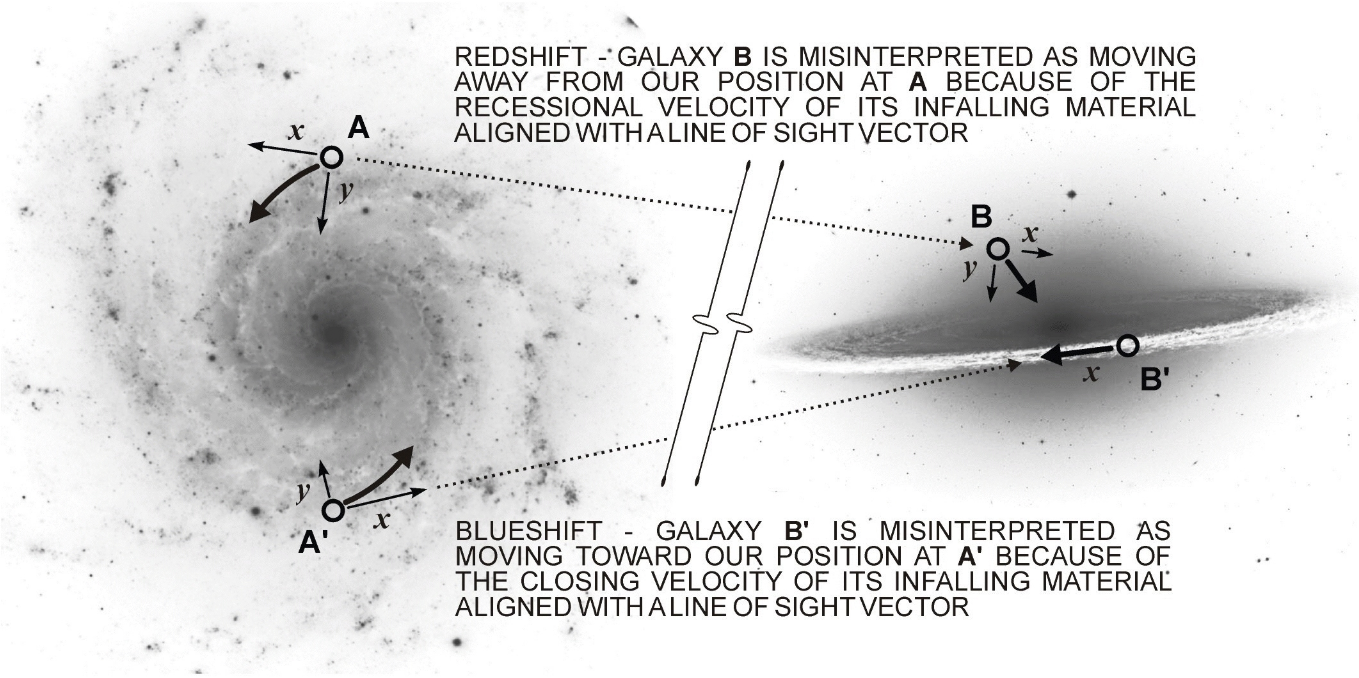
Aren't there many possible sources of cosmological redshifting? At last count, nine seem to have viability. There may be more:

- tired light's energy loss over distance,
- the charge induced to atoms by a galaxy's rotation and linear motion,
- relativistic time dilation from a galaxy's rotation and linear motion,
- light's slower velocity in a galaxy's gravity field,
- gravitational redshift from light's energy loss in gravity fields,
- Einstein's gravitational redshift that's based on relativistic time dilation,
- the Doppler effect from the recessional velocity of each entire galaxy caused by the big bang's expansion,
- the Doppler effect from the recessional velocity of each galaxy's constant infall of ever-condensing material caused by gravity's runaway coalescing,
- and the currently accepted source, (nonexistent) space's stretching caused by the big bang's expansion that displaces light toward the red.

And what about cosmological blueshifting? Are we actually expected to believe that (nonexistent) space is contracting in the direction of the small number of galaxies that exhibit a blueshift? How would that work? If a different source is used to explain blueshift, like gravity interactions, wouldn't that imply the existence of its opposite, another redshift source? And wouldn't that create a conflict with redshift from stretching? None of the other redshift sources, except a galaxy's constant infall of coalescing material, has a consistent explanation for blueshifted galaxies either.

Given gravity's inherent runaway nature, wouldn't it have to be increasingly condensing all of a galaxy's material, constantly coalescing it inward exponentially toward its common center of mass? Wouldn't this have to give it a recessional velocity and associated redshift from the material of every other galaxy, including our own?

Isn't it also entirely plausible that in some circumstances their material would have a closing velocity with ours caused by any combination of a variety of conditions, their gravitational interplay with our or other galaxies, the type of galaxy, its orientation, its density, its rotation's direction and rate, the location and the line of sight infall velocity of the material where the light is being measured? Couldn't even just one of these rationally account for the blueshifting of their light? (See **Figure 4**, Redshift/Blueshift of a Galaxy's Infalling Material)



REDSHIFT/BLUESHIFT OF A GALAXY'S INFALLING MATERIAL

Without a viable explanation for blueshifted galaxies or realizing that any redshift theory based on universal expansion is invalidated by the existence of any other redshift source, like the Doppler effect from the big bang's recessional velocity (the previous source that wouldn't just disappear) or gravitational redshifting from a galaxy's mass that's also widely accepted, light's displacement toward longer wavelengths due to space's stretching is now the most accepted source of cosmological redshifts.

In our real nonexpanding infinite universe, the most likely source of a galaxy's redshifted light is the Doppler effect from the recessional velocity of each galaxy's continuous infall of coalescing material. Many factors influence its recessional velocity: the type and mass of the galaxy, the location on the galaxy where the redshift is recorded, the velocity and angle of its infalling material, the direction and rate of its rotation, its gravitational interplay with our or other galaxies, etc. Ultimately, all we can know for certain is the line of sight recessional velocity of the infalling material coupled with our own line of sight infall velocity.

If we were located at **A**, we'd be swirling around our galaxy's vortex of infalling material in the direction of the heavier arrow. If we were looking opposite our direction of infall at a galaxy's stars at location **B**, our rotational velocity would yield line of sight vectors for all three dimensions, x, y & z of our infall velocity. The z vector in the third dimension is not shown for clarity. For the material at **B** that may be located in an elliptical or the central bulge halo of a spiral as pictured, it too would have three infall velocity vectors keyed to our line of sight. But we can only perceive the rate of the line of sight x vector. And even then, we couldn't know how much to attribute to us or the other galaxy's infalling material. All we can be certain of is that x at **A** plus x at **B** gives us a line of sight recessional velocity and a corresponding redshift. As an example of blueshifting, if we were located at **A'** looking in the direction of our infall at the oncoming material at the edge of another spiral at **B'**, there might be a closing rate where $-x$ at **A'** plus $-x$ at **B'** would give us a line of sight closing velocity and a corresponding blueshift in the spectrum of that galaxy's light.

These simple illustrations conceptually represent just two of the countless possibilities for the true source of red or blueshifted galaxies, the constant infall of coalescing material at each galaxy that's perpetually recycling because of gravity's inherent runaway nature in an infinitely vast, ageless universe .

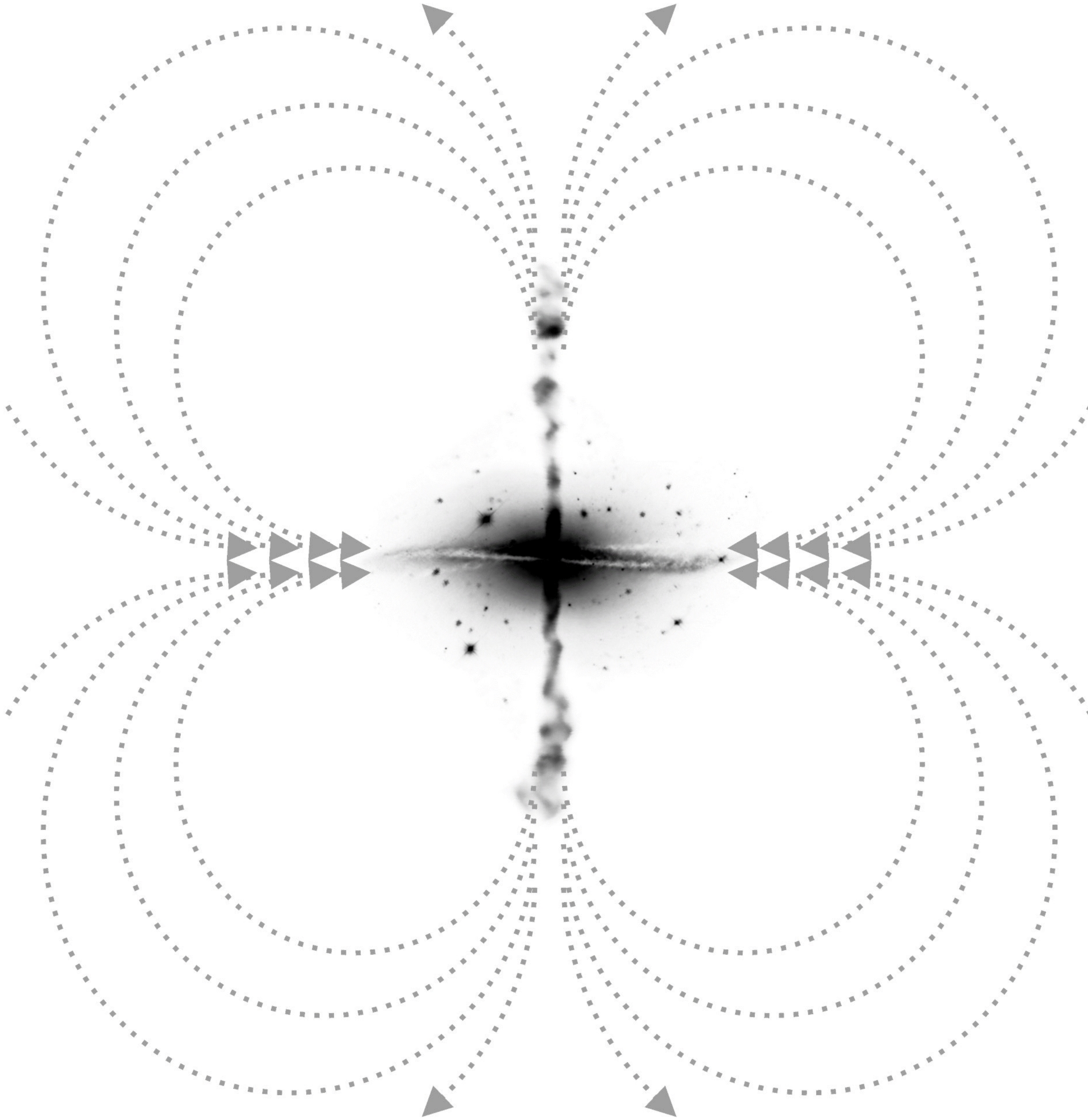
The whirlpool image also used in other diagrams is a modified black and white negative of galaxy NGC 628 taken by the Gemini Observatory - GMOS Team with the Gemini North Telescope on Hawaii's Mauna Kea. The "Sombrero" image is a modified black & white negative of NGC 4594 taken by NASA/Hubble Heritage Team.

Figure 4 (46 G Redshift vi 3a)

As a galaxy's infalling material continues to accumulate, wouldn't the resultant pressure from its ongoing condensing have to continue to build and eventually trigger fusion reactions? Wouldn't it then be transmuted back into the radiant/plasma energy it originated from and be radiated back out of the galaxy, or in well-developed spirals be spewed out in huge bipolar jets? Wouldn't this essentially act as a drain for its whirlpooling vortex of ever-condensing/collapsing infalling material?

As the expelled radiant/plasma energy slows and cools, wouldn't it eventually reconstitute back into ordinary matter? And then over time, wouldn't it have to begin to gravitate back to its or another nearby galaxy? Wouldn't this set up a never-ending process of perpetual recycling at each galaxy?

Doesn't this sensibly explain how galaxies might remain relatively static while exhibiting a redshift from recessional velocity and occasionally a blueshift from closing velocity? Wouldn't this yield an infinitely vast, ageless universe in a persistent steady-state condition that at the same time is very dynamic? (See **Figure 5**, The Continuous Recycling of a Galaxy's Material; **Figure 6**, Redshift - Expanding Space/Ceaseless Coalescing)



THE CONTINUOUS RECYCLING OF A GALAXY'S MATERIAL

Gravity is inherently a runaway process. Protogalactic material begins to coalesce three-dimensionally, elliptically. As it draws together, any asymmetry naturally causes it to rotate around a developing axis with poles. But because the resulting centrifugal force is less at the poles, it begins to coalesce more readily down the axis, causing it to eventually flatten out into the disks that define a fully developed spiral galaxy, shown in side view.

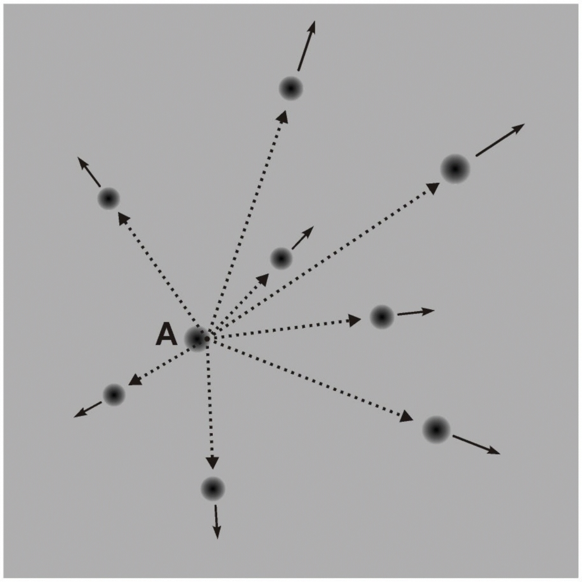
But its inward migration doesn't stop there. The exponential decrease in density of the galaxy's gravity field toward its center causes its coalescing and condensing to increase exponentially. This manifests as a continuous, two-dimensional vortex of infalling material.

As the material in this flatten whirlpool continues to spiral inward, the compression becomes so great as it approaches the galactic center that fusion reactions are triggered that begin converting it back to radiant or plasma energy that's spewed out in huge jets in a bipolar fashion, represented here as visible.

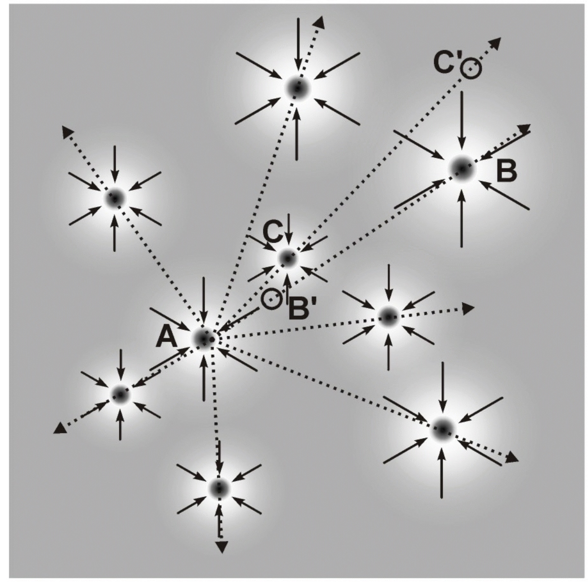
As the radiation slows and cools, it reconstitutes back to ordinary matter that naturally begins to gravitate back toward its or another nearby galaxy, as suggested by the dotted arrows. The material of every galaxy is subject to this never-ending process of recycling.

The image is a highly modified black and white negative of galaxy ESO 510-G13 taken by NASA and the Hubble Heritage Team with the HST.

Figure 5 (19.1 G Recycling vi 3a)



1. BIG BANG



2. DYNAMIC STEADY-STATE

REDSHIFT - EXPANDING SPACE / CEASELESS COALESCING

The smooth gray background in diagram **1** portrays the big bang's physically impossible uniform expansion of space. The dots represent galaxies that are assumed to be moving away equally from every other galaxy because of the universe's two-dimensional curvature like the surface of a sphere. The solid arrows indicate each galaxy's direction of motion from our position at **A**, which would be radial in three dimensions as it appears. Their length corresponds to the galaxy's inferred recessional velocity and redshift that's believed to increase with distance due to space's stretching.

Diagram **2** portrays an infinitely vast, eternal universe in a dynamic but steady-state condition where each galaxy is perpetually recycling its material. Their motion is limited to their gravitational interplay while their material continuously migrates inward, constantly infalling, ceaselessly coalescing and condensing because of gravity's inherent runaway nature until it's ultimately collapsed back into radiant energy/plasma and radiated or ejected out where it eventually slows and cools becoming ordinary matter again that begins to be gravitationally drawn back to its or another nearby galaxy to be recycled.

The dots in diagram **2** also represent galaxies with our location at **A**. The diffusing background at each galaxy depicts the universal field's exponentially decreasing density in section view. The inward pointing arrows at each galaxy suggest the ceaseless omnidirectional coalescing of its infalling material that's condensing three-dimensionally from every direction. The arrows' length corresponds to its infall velocity. That infall velocity coupled with our own infall velocity at our own galaxy produces a recessional velocity, which is the true source of each galaxy's redshift, not universal expansion. Depending on the type, orientation, and gravitational interplay, the material of a small number of galaxies has a closing velocity that produces a corresponding blueshift.

With redshift no longer an indication of distance, every galaxy could literally be any distance away along our line of sight. A small compact massive galaxy with a high redshift that appears to be hundreds of millions of light-years away, like at **B**, could literally be right next door at **B'** and we'd never know it. Or a galaxy that appears very close with lower redshift, like at **C**, may actually be a great distance away at **C'**. There's no way to tell using galactic redshifts.

Also, because of an object's decreasing size in the universal field's decreasing density where light's velocity slows correspondingly, the galaxy at **B'** that appears hundreds of millions of light-years away may actually be that far if we were to attempt to travel there. It's entirely possible that it could take less time to travel to its backside by circumventing it along its perimeter than to travel directly to its core.

Figure 6 (41 BB-DSS vi 8a)

Convention has the material of galaxies not continuously coalescing and condensing but held at bay in a constant circular orbit by its centrifugal force due to the conservation of angular momentum. That's an argument that might be made if the system were closed and static. But an infinite universe that's perpetually recycling its material through, and between, galaxies can't be a closed system.

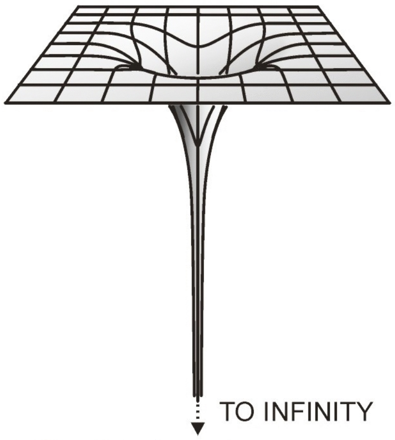
Also, how could centrifugal forces that under many conditions wouldn't even exist, especially for ellipticals and some irregulars, counter gravitation's ever-increasing condensing and forestall its material's inward migration? If there's no rotation, there'd be no counteracting centrifugal force.

For spirals, which manifest a whirlpool of ever-condensing infalling material, there is more centrifugal force. But it originates from the gravitating material's own coalescing. So how could it ever counter its inward migration and push it out into a fixed circular orbit? Wouldn't that require additional tangential velocity from an outside source?

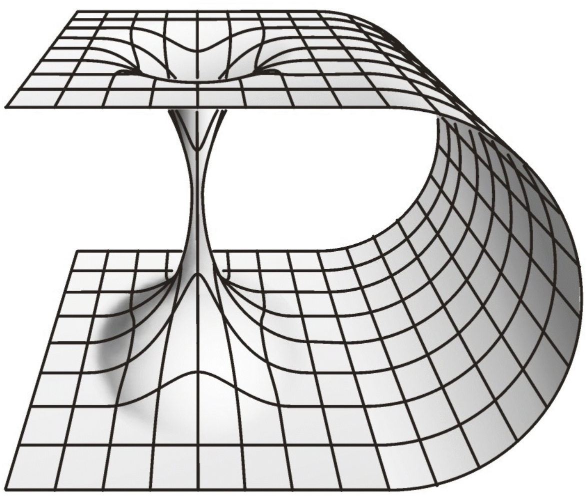
How can we assert that gravity's runaway nature is a universal principle that applies to all bodies beginning with subatomic particles, but it doesn't apply to galaxies that are composed of those bodies and subatomic particles?

If a galaxy's material is held in a fixed circular orbit, how is it even conceptually possible for any of it to ever make its way to its core to then be consumed by its supermassive black hole? And then, how would it be possible for it to begin to ceaselessly gravitate and endlessly "spaghettify," stretching not condensing as gravity actually does, as it falls forever toward infinity down the black hole's two-dimensional, funnel-shaped (nonexistent) space?

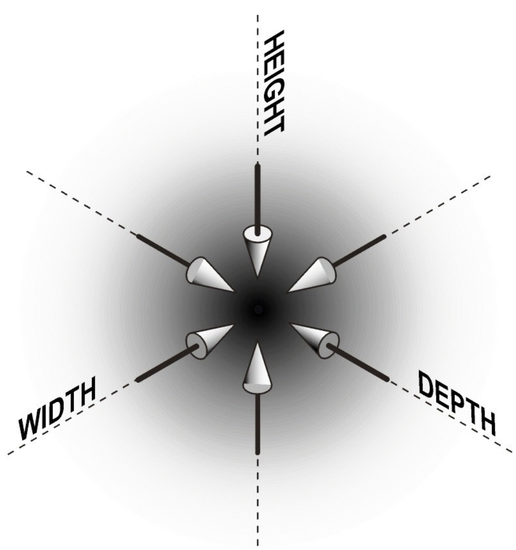
In the three actual dimensions of our tangible environment, wouldn't gravitation immediately condense coalescing material together at its common center of mass? It has no place else to go. Isn't all this just more illusive mathematical gimmickry that's also based solely on abstract nonphysical two-dimensional geometry that has no practical relevance to our real three-dimensional world? (See **Figure 7**, Three-Dimensional Space)



1. BLACK HOLE



2. WORMHOLE



3. REALITY

Figure 7

THREE-DIMENSIONAL SPACE

The notion that space is something and that it expresses two-dimensionally has led us to mistakenly reason black holes. Their gravity is presumed to be so strong they create a two-dimensional funnel-shaped curvature in their inconceivable four-dimensional space-time, usually portrayed in diagrams similar to **1**. It's imagined that any object, or light, that strays too close will be drawn over a theorized event horizon, never to be heard from again, where it endlessly infalls while stretching, or "spaghettifying" as it's called, as it accelerates without end toward the infinite (mathematical) condition of a singularity.

The same mistaken logic is applied to so-called wormholes. Space's fictional two-dimensional composition, commonly depicted in diagrams similar to **2**, would supposedly allow us to shortcut through a black hole that's not infinite but tied to another black hole at another location in our curving two-dimensional universe.

In reality, space is the nothingness between objects. There's nothing there. But if it really were something, it'd still have to be three-dimensional, as indicated in diagram **3**. It'd have to have width, height, and depth. That's it. Additional dimensions are inconceivable. And two-dimensions, despite being incorrectly justified as merely an analogy, only describe the location of a plane. Without the third dimension of height, existence isn't possible.

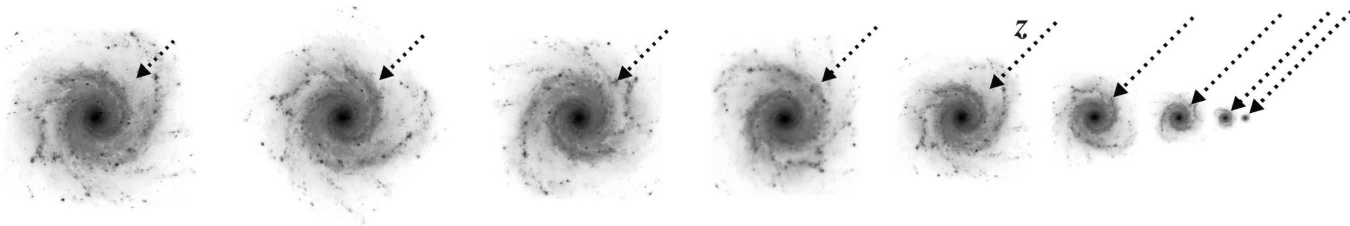
Whether you insist that space is actually something or accept the universe as a field of radiant electromagnetic energy that corresponds to all space, in our reality of three actual dimensions, coalescing infalling material, represented by the condensing grey three-dimensional sphere in **3**, would quickly arrive at a common center of mass. There's nowhere else for it to go. It cannot slip over the edge of a nonexistent two-dimensional funnel-shaped space on an endless journey to infinity. That's a make-believe science fiction fantasy that's justified through two-dimensional mathematical gimmickery.

Gravity's exponentially decreasing field density continuously coalesces and condenses matter together in a runaway recycling process where it's increasingly compressed until fusion reactions are triggered that perpetually convert it back to its original state of radiant energy.

(12 3-D Space vi 13a)

Given the implausibility of fixed circular orbits for a galaxy's material and the objective certainty of gravitation's runaway coalescing, wouldn't galaxies with a higher concentration of mass produce faster infall velocities for its ever-coalescing/condensing material? Doesn't this suggest that for those galaxies whose recycling is waning, the more condensed they become, the smaller their size, the faster the infall of their material, and the higher their redshift?

Wouldn't this appear as more distant galaxies (or quasars) with faster recessional velocity because their decreasing size, and/or brightness, corresponds to increasing redshifts? Isn't this what we presume to observe? But isn't it reasonably possible that it's a simple misinterpretation where we've been mistaking this for universal expansion/stretching and its increasing rate when in reality it's just gravitation's natural runaway coalescing/condensing at each galaxy? (See **Figure 8**, A Galaxy's condensing)



A GALAXY'S CONDENSING

We estimate a galaxy's distance by its size, brightness, the brightness of certain types of its stars and supernovas, but mostly by its redshift. From these, we've inferred that galaxies have an accelerating recessional velocity from us, and every other galaxy. Presumably, they're being swept away by a uniformly expanding space whose rate increases with distance. This is a misinterpretation that's become our conceptually impossible, big bang orthodoxy.

Imagine that we could speed up time while observing a galaxy's continuously infalling coalescing material. For a spiral galaxy, we'd see it swirling down its whirlpooling vortex as it condenses. Let's also imagine that the continuous recycling of its material is waning, or that its replenishment has decreased down to near nothing.

What we'd get is the continuous contraction of the entire galaxy as its infalling material condenses. The resulting pressure from gravity's runaway coalescing continues transforming its material, collapsing it back into the radiant energy it originated from by triggering fusion reactions that's then radiated back out. Or for most spirals, it's ejected out as high velocity, bipolar jets. Eventually, as the galaxy's material is depleted, it shrinks down to nothing as it reaches the end of its existence.

Without any new or recycled material to maintain its size, it contracts exponentially, as indicated by the sequence of shrinking galaxies. The rate of the recessional velocity of its infalling material would also be increasing exponentially along with its corresponding redshift, as suggested by the increasing length of the arrowed lines at z. Its brightness would also be decreasing exponentially. All governed by the inverse square law, an innate property of a sphere's three-dimensional geometry.

In concept, gravitation's runaway exponential condensing would have to apply across the board to all types of galaxies, ellipticals, irregulars, and peculiars, not just spirals. It would have to include quasars as well.

Their much smaller size, reduced brightness, and higher redshifts have us inferring them to be mysterious objects that reside at much greater distances. But it's more likely that they're just normal galaxies whose collapsing material has been devoured down to a point that their dense cores have been exposed where the material's ever-increasing infall/recessional velocity is exponentially faster. Regardless of the disposition of each galaxy or quasar's material, we misinterpret the redshift from its infalling recessional velocity as originating from the recessional velocity of each entire galaxy, or more precisely from space's stretching between galaxies.

This altered photo of NGC 628 was taken by the Gemini Observatory -GMOS Team with the Gemini North Telescope on Hawaii’s Mauna Kea.

Figure 8 (43 G Size vi 3a)

If gravitation really is a runaway process and if recessional velocity actually does produce a redshift, wouldn't the constant infall of ever-coalescing material at each galaxy have to produce a recessional velocity with an associated redshift that has to be accounted for in addition to the redshift presumably produced by universal expansion/stretching? There's no way to avoid it.

Why is it that no one has noticed that if even one other redshift source at galaxies is found to be legitimate, it would coexist and conflict with the redshift from (nonexistent) space's stretching? How then could we ever know how much redshift to attribute to each? We could never determine the universe's rate of expansion, or whether it was even expanding at all. Again, if there's no expansion, there's no big bang.

If we want to preserve the big bang, wouldn't we have to disregard all other redshift sources? But redshift from recessional velocity is still widely held. Gravitational redshift is also widely accepted. So is Einstein's relativistic version of gravitational redshift.

He himself asserts, "If the displacement of spectral lines towards the red by the gravitational potential does not exist then the general theory of relativity will be untenable [10]." (Actually, all of it would be. Its special and general theories are interdependent for his interpretation of gravitational redshift.) But discounting all other redshift sources other than expansion's would mean discounting Einstein's gravitational redshift. And that would nullify relativity.

But if we retain gravitational redshift to preserve relativity then we have contradictory redshift sources and the big bang is invalidated. At the most fundamental level, the big bang and relativity are conflicted. They can't coexist. And we find ourselves abruptly confronted with an intolerable predicament. We're forced to choose one or the other. Quite the dilemma, isn't it?

Conclusion

Unless uniformity can somehow be rationally explained, cosmology is facing a significant if not a catastrophic crisis. We're wholly unprepared for the total collapse of our relativity-based big bang orthodoxy. Imagine the havoc that would be wrought. A mistake so colossal, elemental, consequential, and yet so overtly conspicuous will be devastating, not just for cosmology but throughout all of science. How will the public ever be able trust their authorities again?

But don't expect that paradigm shift to occur anytime soon. Admitting error is not in our nature or at least the elitist nature of most academics. But it will eventually happen. We can't disregard the mounting evidence and ignore the irrefutable logic forever.

Any cursory but truly objective inquiry will quickly find that our homogeneous, isotropic universe can't be expanding. Nor can it be finite. Expansion would have it diffusing exponentially. And if it were finite, gravity would have it condensing exponentially, even if space was something that actually existed and was expanding.

If our universe was somehow able to express two-dimensionally, it could conceptually remain uniform as it expands. But there's no existence in two dimensions. So Einstein's finite yet unbounded musings are also out of the question. An expanding, three-dimensional, but infinite universe is just as unfeasible. It's nullified from the outset by its inherent contradictions. So the big bang cannot be real. It's a scenario that's strictly theoretical.

If universal expansion is not real, (nonexistent) space can't be stretching to redshift the light of galaxies. So cosmological redshift must originate from a different source. If the big bang never occurred then no primordial conditions existed to produce the cosmic microwave background radiation. So it must originate from a different source as well.

The most practical way to reconcile observation with an infinite, non-expanding reality is if cosmological redshift originates from the recessional velocity of each galaxy's constant infall of ever-coalescing material and cosmic microwave background radiation is produced innately by the galaxies it corresponds to. This yields an infinitely vast, eternal universe (that we all know it really is) that's in an extremely dynamic but steady-state condition where runaway gravitation is perpetually recycling all matter through galaxies, continuously condensing, collapsing, and transforming it back into its original state of pure radiant energy.

Declarations

The author certifies that he did not receive any funding, grants, or any type of support from any individual, institution, or organization in the connection with the study or preparation of this work. The author further certifies that he does not have any financial or competing interests in connection with this work or ties of any kind to any individual or organization that might.

References

[1] "Inverse-square law," Wikipedia: The Free Encyclopedia, last modified Dec 13, 2022, https://en.wikipedia.org/wiki/Inverse-square_law.

[2] "Platonic solid," Wikipedia, last modified Apr 24, 2023, https://en.wikipedia.org/wiki/Platonic_solid.

[3] Albert Einstein, *Relativity: The Special and the General Theory*, 15th ed. Translation by Robert W. Lawson (New York: Three Rivers Press, 1961), 122-127.

[4] Einstein, *Relativity,* 153.

[5] Einstein, *Relativity,* 125.

[6] Einstein, *Relativity,* 125-126.

[7] Einstein, *Relativity,* 158.

[8] "Space," Merriam-Webster Dictionary, last modified Mar 26, 2023, http://www.merriam-webster.com/dictionary/space.

[9] "Fred Hoyle," Wikipedia, last modified Jun 28, 2023, https://en.wikipedia.org/wiki/Fred_Hoyle.

[10] Einstein, *Relativity,* 151.

Bibliography

Arp, Halton. *Seeing Red: Redshifts, Cosmology & Academic Science*. Montreal: Aperiron, 1998.

Einstein, Albert. *The Meaning of Relativity*. 5th ed. Translated by Edwin Plimpton Adams, Ernst G. Straus, Sonja Bargmann. Princeton: Princeton University Press, 1953.

Einstein, Albert. *Relativity: The Special and the General Theory*. 15th ed. Translated by Robert W. Lawson. NY: Three Rivers Press, 1961.

Encyclopedia Britannica, last access 2024, https://www.britannica.com.

Gonder, Kenneth. *The Reality of Relativity*. 7.4 240120, Last revision 2024. Amazon or B&N, Independently published, 2018, https://www.amazon.com/dp/B07CVMDV66 or https://www.barnesandnoble.com/w/the-reality-of-relativity-kenneth-gonder/1137950355?ean=2940162675266, (LCCN: 2020901711).

Hyperphysics, last access 2024, http://hyperphysics.phy-astr.gsu.edu.

Merriam-Webster Dictionary, last access 2024, https://www.merriam-webster.com.

NASA, last access 2024, https://www.nasa.gov.

Science News, 1999 - 2018. https://www.sciencenews.org.

Scientific American, 1994 - 2024, https://www.scientificamerican.com.

Sky & Telescope, 2000 - 2024, https://skyandtelescope.org.

Wikipedia: The Free Encyclopedia, last access 2024, https://www.wikipedia.org.