Journal of Physics & Astronomy

Review| Vol 8 Iss 2

The Big Bang Never Happened: A Conclusive Argument

Rowland D*

Independent Researcher, Canadian Association of Physicists, Canada

***Corresponding author:** Rowland D, Independent Researcher, Canadian Association of Physicists, Canada, E-Mail: david222@hush.com

Received: February 15, 2020; **Accepted:** March 2, 2020; **Published:** March 20, 2020

Abstract

For over 100 years, the prevailing belief has been that the universe was created by a big bang singularity. This speculative event is an impossibility that has become a firmly entrenched notion only because of a fundamental scientific error that few have questioned, until now. This paper provides both logical proof and corroborating scientific evidence that the universe could not have begun from a singularity, that galaxies are not receding from the Milky Way, and that we are not on a collision course with Andromeda. Edwin Hubble made faulty assumptions and significant miscalculations. Big bang theory presupposes that somehow the universe spontaneously created itself from nothing. This notion defies both physics and logic, the science of thinking and reasoning. Nothing cannot be the cause of something. Aristotle is reputed to have expressed it this way: "The notion that there could be nothing that preceded something offends reason itself."

Keywords: Big Bang, Astronomy, Astrophysics

1. Introduction

For over 100 years, the prevailing belief has been that the universe was created by a big bang singularity. Because of both logical and scientific errors, this speculative event could not possibly have happened.

The big bang idea has become firmly entrenched because of a fundamental scientific error compounded by faulty assumptions, presumptive reasoning, and miscalculations. When these oversights are corrected, we are left with zero evidence supporting any of the suppositions that (a) the universe began from a singularity, (b) galaxies are receding from each other, or (c) we are on a collision course with Andromeda.

Every variation of big bang theory suggests that somehow the universe spontaneously created itself from nothing. This notion defies both physics and logic, the science of thinking and reasoning. Nothing cannot be the cause of something.

Citation: Rowland D. The Big Bang Never Happened: A Conclusive Argument. J Phys Astron. 2020;8(2):193.

The universe is everything that exists. There is nothing existing outside the universe that could possibly bring it into existence. Aristotle is reputed to have expressed it this way: “The notion that there could be nothing that preceded something offends reason itself.”

Redshift is Attenuation; Doppler is Distortion

In 1915, astronomer Vesto Slipher observed that light from some spiral nebulae is redshifted, meaning that its frequency drops toward the red end of the spectrum and its wavelength correspondingly increases. Slipher falsely presumed that this phenomenon is a Doppler effect in which a light source moving away from the observer stretches the wavelength of the light it emits [1]. If Slipher had understood that the true wavelength of sound actually remains constant during the Doppler effect, he would have realized that redshift is an entirely different phenomenon.

Doppler is distortion. Sound consists of uniform longitudinal waves passing through the elastic medium of air at a constant frequency. When its source movies towards you, identical length waves hit your ear more frequently, distorting the perceived sound to a higher frequency. As a sound source moves away from you, identical length waves hit your ear less frequently, distorting the perceived sound to a lower frequency.

Suppose an ambulance heading towards you at 70 km/h emits musical note A (frequency 440 Hz, wavelength 0.773 m). Suppose also that the first note you hear as the siren comes into earshot is Bb (466 Hz). As the ambulance passes by, you hear the true A440. After the siren passes, you hear in the distance Ab (415 Hz). The wavelength of the sound emitted by the siren (0.773 m) never changes. Both the Bb and Ab are distortions of the true A440 sound.

Light waves are transverse and travel at 3.0 x 108 m/s through space, where there is no medium to resist their movement. Thus, light waves can neither bunch together (creating the illusion of increasing frequency) – nor drift apart (creating the illusion of decreasing frequency). Whatever frequency is measured is the actual frequency of light at that point of observation.

Redshift is simply the measurable tendency of light to attenuate. The velocity and energy of light always remain constant. However, over extreme distances the frequency of visible light gradually diminishes towards the red end of the spectrum while its wavelength increases by a corresponding amount.

In redshift there is an actual increase in wavelength. In Doppler, there is only the illusion of a change in wavelength. Redshift and Doppler are fundamentally different. To presume they are the same Doppler-redshift is rather like referring to a line in geometry as a straight-curve.

For over a century, astrophysicists have been falsely presuming that redshift measures the velocity of a light source away from the observer. Redshift, however, is a function of only two variables, surface temperature and distance, neither of which have anything to do with velocity.

Because the surface temperature of the Sun is 5,5000 C, it emits light in the yellow range of the spectrum. Similarly, a star with a surface temperature of 12,0000 C emits light at the blue end of the spectrum, and one with a surface temperature of 3,0000 C emits light at the red end of the spectrum.

If Star X at a temperature of 7,0000 C and Star Y at 12,0000 C are the same distance from Earth, we could simultaneously be receiving light from X in the red end of the spectrum and light from Y in the blue end of the spectrum. The temptation is to conclude that light from X is redshifted and light from Y is blueshifted, but that would be a mistake. The light from both X and Y is being attenuated (redshifted) at the same rate. It is only because light from Y started out at a much higher frequency that it has not yet dropped into the red end of the spectrum.

Expansion Theory

In 1925, mathematician Alexander Friedmann proposed that the universe could be either expanding, contracting, or remaining static. He developed equations to predict either the rate of expansion or rate of contraction, once it was known which the case was.

In 1927, astronomer Georges LeMaître independently developed the same equations as Friedmann. LeMaître, however, presupposed that the universe is expanding and provided mathematics to support his foregone conclusion.
In 1929, Edwin Hubble formulated Hubble's law, which states that objects in deep space have a presumed relative velocity away from Earth and their velocity of recession is approximately proportional to their distance from Earth. Hubble's law is considered the first observational basis for expanding universe theory and today is one of the pieces of evidence most often cited in support of the alleged *big bang*[**4].**

In 1931, Georges LeMaître published the English version of his earlier paper entitled, "*A homogeneous Universe of constant mass and growing radius accounting for the radial velocity of extragalactic nebulae*" [**5].** He initially called his theory the "hypothesis of the primeval atom" and described it as the "cosmic Egg exploding at the moment of creation." In addition to being an astronomer, LeMaitre was also a Catholic priest who felt comfortable with the notion that God had created the atom/egg that subsequently blew up to create the universe. Thus, what later become known as *big bang* theory may have its origin in metaphysics rather than astrophysics.

Circular Reasoning

Every version of expansion theory inadvertently includes its conclusion in its assumption, then uses this assumption to prove its foregone conclusion. This is the logical fallacy of circular reasoning.

In 1912, Henrietta Swan Leavitt discovered a direct relation between the brightness of Cepheid variable stars and the period of their pulsations **[6]**. This brightness-periodicity relationship tells us at what stage each Cepheid may be in its unique life cycle – and absolutely nothing about where said star may be located.

Edwin Hubble made three *a priori* assumptions: (1) the universe began at a single point in time; (2) all Cepheids are the same age; and (3) the brightness of Cepheids is a function of their distance. Hubble's circular reasoning is that he assumed all Cepheid stars are retreating from us, then misused Leavitt brightness-periodicity calculations as evidence to show how far Cepheids have travelled.

Both LeMaitre and Hubble calculated what they believed to be radial velocities of nebulae. They did so by taking the supposed velocity they claim to have measured on the vector between Earth and each nebula in question, then using trigonometry to estimate what the velocity would be on a vector from the universe's presumed origin – without having the foggiest idea where said origin could possibly be located. Both scientists started with the *a priori* assumption that the universe was created by a singularity that happened at a specific point in space, then developed calculations to justify their foregone conclusion.

Hubble's "Law"

Hubble's law is fatally flawed – because of statistical anomalies, faulty assumptions, circular reasoning, and data that may have been contrived.

Statistical Insignificance:

Edwin Hubble studied 24 galaxies and selected the results from five of these that demonstrated a perfect straight-line relationship between distance and velocity. Five is a statistically insignificant sample size from which to project meaningful data about the entire universe.

Selection Bias: Hubble used only the data of galaxies from which light was redshifted and ignored data of galaxies from which he knew light appeared to be blueshifted (e.g., Andromeda, M86, M90, M98). He thus chose only data that supported his foregone conclusion and ignored data that conflicted with it. This selection bias disqualifies the Hubble theory as constituting a *law* . A law in physics permits no exceptions. Newton's universal law of gravitation, for example, does not allow for the occasional exception whereby some objects fall upwards or repel each other.

Faulty Assumptions: Hubble did not and could not measure velocities of galaxies. Instead, he relied on the following false or unwarranted assumptions to infer velocity:

1. **All galaxies are approximately the same size**. This assumption caused Hubble to overestimate the distances of small galaxies and underestimate the distances of large ones.
2. **The brightness of a Cepheid star is a function of its distance**. The pulsations of these super massive stars are caused by physical changes that are a function of the life cycle of that star, regardless of how far away it may be. An older, brighter Cepheid star with slower pulsations in a nearby galaxy would thus appear to Hubble to be closer than a newer, less bright Cepheid star.
3. **The dimness of a galaxy is a function of its motion away**, i.e., that as a galaxy retreats, its brightness diminishes. Without also measuring the surface brightness of a galaxy (per unit area), we can conclude absolutely nothing about

its supposed motion. Only if the surface brightness of a distant galaxy is significantly less than the surface brightness of nearby galaxies is it reasonable to infer that said galaxy is in motion away from us.

4. **The redshifting of light from galaxies is caused by rapid movement of those galaxies away from us.** This error is rampant in mainstream cosmology – that of mistaking redshift for a Doppler effect, whereas they are in fact two fundamentally different phenomena.

Fallacy of Presumption (circular reasoning): Hubble inadvertently included his conclusion in his assumption, then used this assumption to prove his conclusion. He (a) presumed that galaxies are accelerating away from us, (b) presumed that redshift measures velocity, then (c) produced estimates of distance to justify that the redshifts in question demonstrated acceleration.

False premise: Hubble based his entire theory on the misconception that redshift measures velocity. Details above make it clear that redshift can only be construed as a measure of distance and temperature of source.

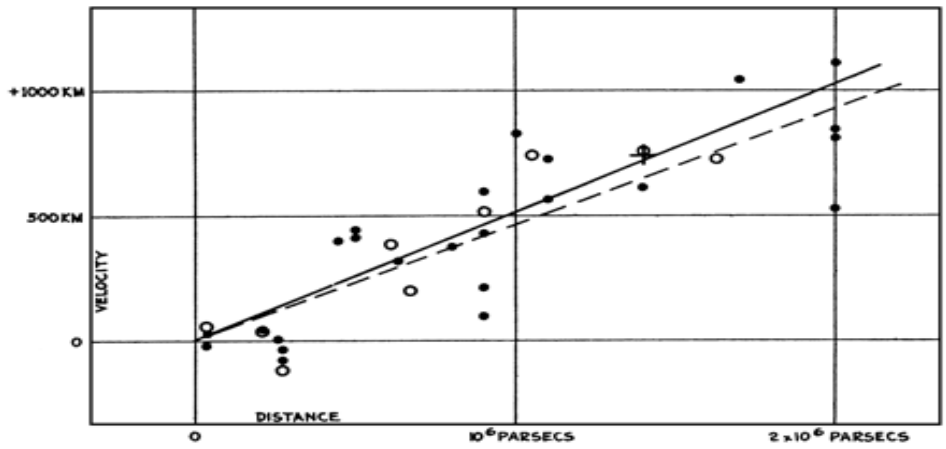
The following **TABLE 1** summarizes the estimates from which Edwin Hubble in 1929 concluded that galaxies are receding from the Milky Way at a velocity proportional to their distance.[4] Entries in the "**Distance-EH**" column indicate the distances that Hubble estimated (based on his multiple flawed assumptions).[4] Entries in the "**Presumed Velocity**" column indicate the velocities that Hubble inferred from his measures of redshift (falsely presuming redshift to be a Doppler effect).[4]

Table 1: Edwin Hubble's Estimates of Distances and Velocities

Cluster Galaxy	**Distance-EH**[4] (ly)	**Presumed Velocity**[4] (km/s)	**Ratio** (Velocity/Distance)
Virgo	78	1,200	15.4
Ursa Major	1,000	15,000	15.0
Corona Borealis	1,400	22,000	15.7
Bootes	2,500	39,000	15.6
Hydra	3,960	61,000	15.4
Average			**15.4**

The results in the ***Ratio*** column above are the five points that Hubble posted on a graph to create a remarkably tight straight-line relationship between the distance of a galaxy and how fast it is supposedly moving away. These calculations support a distance-velocity relationship that is considered the ultimate definitive evidence supporting expansion theory.

FIG 1: Distance-velocity relationship.



Something is seriously wrong with Hubble's estimates of distance, however. If we substitute modern estimates of distance in the *Distance-Modern* column below, a very different picture emerges. Data in the *Distance-Hubble* column are the figures published by Edwin Hubble in his seminal 1929 paper.[4] Data in the *Distance-Modern* column are published data sourced from the Hipparcos Catalogue of 188 218. On the assumption that the Hipparcos data may be accurate to plus or minus 10%, the estimated *Error Factor* reveals a spread of 22% in each case **(TABLE 2)**.

Table 2: Modern Estimates of Distance Compared to Edwin Hubble's Estimates

Brightest Star	**Distance-Modern** (ly)	**Distance-Hubble**[4] (ly)	**Error Factor**
Spica (Virgo)[8]	262.19	78	(- 3.0x to -3.7x)
Alioth (Ursa Major)[9]	80.93	1,000	11.2x to 13.7x
Alphecca (Corona Borealis)[10]	75.05	1,400	17.0x to 20.7x
Arcturus (Bootes)[11]	36.72	2,500	61.9x to 75.6x
Alphard (Hydra)[12]	180.30	3,960	20.0x to 24.4x

Edwin Hubble apparently estimated Virgo to be about 3.3 times closer than it really is, and the other star clusters to be from 11.2 to 75.6 times further away than they really are.

If Hubble had used realistic estimates of distance, there would have been no straight line on his graph, only random points indicating a zero correlation between distance and velocity. Thus, it appears that Hubble may have manipulated data to produce the results he wanted.

Either galaxies are moving apart, or they are not. The theory which suggests that the distances between galaxies are increasing is fatally flawed. Therefore, we must presume that galaxies are in the same positions relative to each other that they have always been in. This burden of proof is the same as required in a court of law. If the prosecutor's theory that the defendant is guilty cannot be substantiated, then he must be presumed to be not guilty. The Hubble theory that galaxies are moving apart cannot be substantiated; therefore, we must presume that they are not moving apart.

Hubbles' "law" is thus an interesting mathematical diversion that bears no relation to reality. Redshift is ***not*** Doppler. Galaxies are ***not*** retreating from the Milky Way. If galaxies are not in retreat, then their imagined velocity of retreat cannot be increasing.

The Tolman Surface Brightness Test

We now have direct evidence that the universe is ***not*** expanding. Edwin Hubble's estimates of velocity did not include measurements of surface brightness (i.e., brightness per unit area) of galaxies. Such measurements tell a very different story.
In 1930, mathematical physicist Richard Tolman devised a surface brightness test to determine whether the universe is static or expanding. Tolman's test compares the surface brightness of galaxies to their degree of redshift (measured as z). Tolman believed redshift to be the degree of reduction in energy of each photon [**2].**

In a static universe, the light received from an object drops in proportion to the square of its distance, and the apparent area of the object also drops in proportion to the square of its distance, so the surface brightness (light received per surface area) would be constant, independent of distance. In an expanding universe, the surface brightness would decrease with the fourth power of $(1 + z)$.

For 90 years, mainstream astrophysicists have never checked the validity of their assumptions by means of the Tolman test. They all accept on blind faith Slipher's error of mistaking redshift for Doppler.

The Tolman Test Applied

In 2014, Eric Lerner and a team of astrophysicists applied the Tolman test by measuring the surface brightness (per unit area) of over 1,000 near and far galaxies. If galaxies were moving away from each other, they would appear fainter the farther away they get, i.e., their surface brightness would diminish. Lerner's team, however, found that in every case surface brightness remains constant regardless of distance. If any faraway galaxy had been in motion away from us, its surface brightness would have been much less than that of nearby galaxies, a phenomenon that has never been observed. Thus, there is zero tangible evidence that galaxies are moving apart and overwhelming evidence that they are not **[3].**

One thousand galaxies in the above study is a statistically significant sample size from which to project meaningful data about the entire known universe. It is 200 times the number of galaxies that Edwin Hubble included in his biased sample.

Conclusion: galaxies are ***not*** moving apart. They are in the same relative positions to each other that they have always been in.

Andromeda is No Exception

In 1915, Vesto Slipher presumed that galaxies from which light is redshifted are in motion away from us and conversely, those from which light is blueshifted are in motion toward us. Slipher estimated that some galaxies were retreating from us at the rate of 1,100 km/s – and Andromeda appeared to be approaching us at 300 km/s, based on the degree to which its light appeared to be shifted toward the blue end of the spectrum [**1].**

In 1924, Edwin Hubble studied Andromeda and estimated that it was 0.9×10^6 ly away from us. (NASA's estimate places Andromeda at about 2.5×10^6 ly away.)

In 1927, Edwin Hubble conveniently omitted the supposedly approaching Andromeda from the data on which he based his conclusion that galaxies are retreating from us at a velocity proportional to distance away (Hubble's "law"). This omission is an example of selection bias at its worst. To include Andromeda would have been like Isaac Newton saying that there are exceptions whereby some kinds of fruit fall upwards.

In 2014, Eric Lerner demonstrated that the surface brightness of 1,000 near and far galaxies is constant, without exception. This observation means that (a) galaxies from which light is redshifted are ***not*** moving away from us, and (b) galaxies from which light is blueshifted (e.g., M86, M90, M98, and M31/Andromeda) similarly are ***not*** moving towards us.

If Andromeda were approaching us, its surface brightness (per unit area) would be more intense than the surface brightness of galaxies that are much farther away. Said phenomenon has never been observed. Surface brightness of all galaxies is constant, regardless of their distance away. We are ***not*** on a collision course with Andromeda.

Blueshift Anomalies

Light emitted by stars and galaxies is subject to redshift attenuation over extreme distances, regardless of its frequency at source. Supernovae emit gamma radiation and high frequency visible light at the blue/violet end of the spectrum which, by the time it reaches Earth, has a lower frequency but is still in the blue end of the spectrum. This gives the false impression that light from supernovae has been blueshifted, but it is in fact heading towards the red end of the spectrum and still has a long way to go to get there.

Those who mistake redshift for motion away also mistake blueshift for motion towards, creating the false impression that supernovae and/or their emissions are heading towards us. Supernovae SN1885A and SN1986J (in Andromeda), SN1994D and SN2007bi (in Virgo), and SN1987A (in the Large Magellan Cloud) emit intense blue and violet light that by the time it reaches us has been redshifted from the very high frequency at which it was emitted at source but still appears to us to be in the blue range of the spectrum.

The presumptive error that redshift/blueshift indicates motion depends on the unwarranted assumption that light from stars is always emitted at or near the middle of the visible light spectrum. Evidence from closer to home reveals that this is not necessarily so. Light from the following nebula in the 700 to 5,000 light-year range is predominantly blue at source: Helix NGC7293, Iris NGC7023, and Swan's Crescent NGC6888.

Light from binary star systems regularly alternates between redshift and blueshift. Examples of such binary systems include Alpha Centauri, Sirius, Beta Lyrae, 61 Cygni, Procyon, 55 Cancri, Castor, and Algol – all of which lie within a distance range of 8 to 90 ly. When these binary stars are at their farthest distance from each other, we experience their light as having been redshifted. When each pair of stars is lined up one behind the other, we observe their light as being in the blue range of the spectrum. This phenomenon suggests that lined up stars together generate more intense heat than either does separately, thus synergistically raising the frequency of emission of their combined light to much higher than either star emits independently of the other.

Light from the Virgo cluster is redshifted, but light from five dwarf galaxies within Virgo appears to be blueshifted, including NGC4419, M98, M86, IC3258, and M90. These dwarf galaxies range in distance from 30 to 60 x 10^6 ly. Classic interpretation of these measurements suggests that the entire Virgo cluster is accelerating away from us whereas five sub-galaxies within Virgo are simultaneously accelerating toward us. This interpretation challenges logic. A more reasonable explanation is that light from these dwarf galaxies is emitted at higher frequencies than is light from the other 2,000 or so galaxies in Virgo.

Only a tiny percentage of known galaxies emit light that appears to have been blueshifted, and the farthest of these is M90, at 60 x 10^6 ly. One hundred percent of galaxies between this distance and 13 x 10^9 ly emit light that is redshifted. These two facts strongly suggest that (a) redshift is the natural order of things, and (b) there are no exceptions. Light emitted from every galaxy is always redshifted over extreme distances. If we intercept very high frequency visible light at relatively short distances (e.g., less than 60 x 10^6 ly), it will have been redshifted from source but could still be in the blue end of the spectrum at our point of observation, thus creating the illusion of a blueshift. We need to let go of the presumption that all galaxies emit light at or near the middle of the visible spectrum.

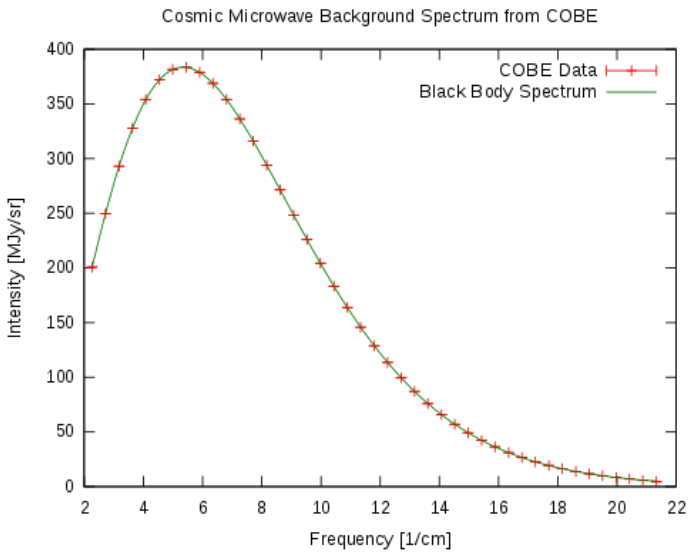
Cosmic Microwave Background

In 1964, cosmic microwave background (CMB) radiation was discovered by radio astronomers Robert Wilson and Arno Penzias. They heard the CMB as an odd buzzing sound coming from every part of the sky at all times. *Big bang* proponents had been searching for confirming evidence for their singularity theory, and this discovery appeared to be it.

CMB radiation can be detected by telescope in every direction as a patchy background, about 13.4 x 10^9 ly away. This observation is mistakenly believed to be thermal radiation left over from *recombination*, the epoch during which charged electrons and protons supposedly first became bound to form electrically neutral hydrogen atoms, shortly after the alleged *big bang*. The assumption is that hydrogen, the lightest element, was made exclusively during the *big bang* and in the general area of its supposed origin. However, ionized hydrogen gas in fact permeates the entire universe.

From 1989 until 1993, COBE satellite Explorer 66 investigated the cosmic microwave background. Astrophysicists expected to see evidence of directional dependency (anisotropy) that could be traced back to the site of the alleged *big bang*. That was not what they saw, however. Instead, Explorer 66 measured an isotropic blackbody spectrum with little variation across the sky [**7] (TABLE 3)**.

Table 3: Blackbody Measurements of Cosmic Microwave Background.



The above graph represents the cosmic microwave background spectrum as measured by the FIRAS instrument on the COBE. As it turns out, this is the most precisely measured blackbody spectrum in nature. The error bars are too small to be seen even in an enlarged image, and it is impossible to distinguish the observed data from the theoretical curve.

NASA thus confirms that the CMB follows the precise curve for blackbody radiation. A blackbody is an opaque object in space that absorbs radiation of all wavelengths that falls on it. Then, when the blackbody is at a very hot and uniform temperature, it emits its own radiation that is outside the visible spectrum of light. NASA's measurements show that this blackbody curve peaks at 0.3 cm. wavelength and 100 GHz frequency, which is at the high end of the microwave spectrum. The blackbodies in question could simply be interstellar dust.

The cosmic microwave background is smooth and looks the same in all directions for the same reason that a fog looks smooth and uniform in all directions. The CMB thus appears as an electromagnetic fog on optical telescopes and as a static hum on radio telescopes.

Bang Goes the Theory

The prevailing, firmly entrenched cosmological model for the universe is that it was created by a *big bang* explosion/singularity that happened some 13.8 billion years ago. This date was arrived at by working backwards in time from equations that purport to measure the universe's rate of expansion.

According to this theory, the entire universe began from some tiny point (or microdot, or quantum) violently exploding out pure energy that almost instantly became particles – and then atoms that eventually combined to form elements, molecules, gases, stars, and galaxies. In other words, the universe spontaneously created itself from nothing.
Proposing a *big bang* or other singularity as cause does not answer the question as to how the universe was created. It simply raises another question as to how the singularity was created.

Points are artificial mathematical abstractions used to specify locations on a graph. Points do not in fact exist. Some variations of the theory are vague about naming what it was that was supposed to have exploded but suggest it was something that had zero dimensions. The same faulty logic prevails: to have zero dimensions is to have zero existence.

Some *big bang* theorists believe that the imagined singularity was a tiny, solid mass with all the matter in the universe compacted into the tiniest bit of space, and then it blew up. Even if it were possible to compress so much mass into such a small space, the intense gravity would have caused it to implode inward rather than explode outward. In addition to this scientific impossibility, there are also two logical errors: (1) all the matter in the universe could not have existed prior to the universe, and (2) something could not have compacted all this matter before any means of compaction existed.

The universe is defined as everything that exists. *Big bang* theory imagines that the something which created the universe existed prior to existence – a contradiction in terms.

Space is defined as the expanse of the universe beyond the Earth's atmosphere. Space is in the universe; the universe is not in space. *Big bang* theory imagines that the something which created the universe was located somewhere before the concept of location (i.e., in space) existed – a second contradiction in terms.

Time is defined as the continuous duration of existence as seen as a series of events. Without existence and events, the concept of time has no meaning. Time is in the universe; the universe is not in time. *Big bang* theory falsely assumes there was a point in time at which time began – a third contradiction in terms.

Many *big bang* proponents claim that it was not a single point in space that exploded but rather every point in the universe participated in the *big bang*. In other words, the explosion happened everywhere at the same time but not at any specific location. Whether one location or every location existed prior to existence is an equally nonsensical argument **[8-12].**

A Child's Perspective

Parent Speaking	**Child Responding**
Once upon a time, a teeny-weeny dot exploded, creating everything that exists.	Who made this dot?
Nobody, it was just there.	Where? If nothing existed, there was no place to put a dot.
Stop interrupting, I am trying to tell a story.	And how could a dot exist before there was such a thing as existence?
Never mind, it just did.	When did this event happen?
Almost 14 billion years ago.	A year is the time it takes for Earth to circle around the Sun, isn't it?
Yes.	Before there were planets or suns, there was no such thing as years. Correct?
Yes.	So how can you say this story began once upon a time? If there weren't any years, there wasn't any time.
Stop trying to be so logical. Not everything is logical.	Apparently not. So why should I believe this story?
Because I said so.	

Conclusion: A Timeless Universe

Either the universe was created by a (*big bang*) singularity or it was not. If it was not created at some point in time, then it must be timeless/ageless. There is no third possibility.

There is no need to develop an alternate theory about the origin of the universe. If it did not suddenly pop into existence, then from our frame of reference it must have always been here. The ill-fated *big bang theory* was an attempt to answer *why* there is a universe. Questions of *why*, however, belong to the realm of philosophy rather than science.

REFERENCES

1. Slipher, Vesto. Spectrographic observations of nebulae, Popular Astronomy. 1915; 23: 21-24.
2. Tolman Surface Brightness Test, Wikipedia.
3. Lerner EJ, Falomo R, Scarpa R. "UV surface brightness of galaxies from the local universe to z~5". International Journal of Modern Physics D. 2014; 23:6.
4. Hubble E. "A relation between distance and radial velocity among extra-galactic nebulae", Proceedings of the National Academy of Sciences of the United States of America. 1929; 15:168-73.
5. Georges L. A Homogeneous Universe of Constant Mass and Growing Radius Accounting for the Radial Velocity of Extragalactic Nebulae. Annales Soc.Sci.Bruxelles. 1927; 47: 49-59.
6. Leavitt HS, Pickering E C. Periods of 25 variable stars in the Small Magellanic Cloud, Harvard College Observatory Circular. 1912; 173: 1-3.
7. Cosmic Microwave Background, Wikipedia.

8. Spica (Alpha Virginis, 67 Virginis) Star Facts, https://www.universeguide.com/star/spica.
9. Alioth (Epsilon Ursae Majoris, 77 Ursae Majoris) Star Facts, https://www.universeguide.com/star/alioth.
10. Alphecca (Corona Borealis, 5 Coronae Borealis) Star Facts, https://www.universeguide.com/star/alphecca.
11. Arcturus (Alpha Boötis, 16 Boötis) Star Facts, https://www.universeguide.com/star/arcturus.
12. Alphard (Alpha Hydrae, 30 Hydrae) Star Facts, https://www.universeguide.com/star/alphard.