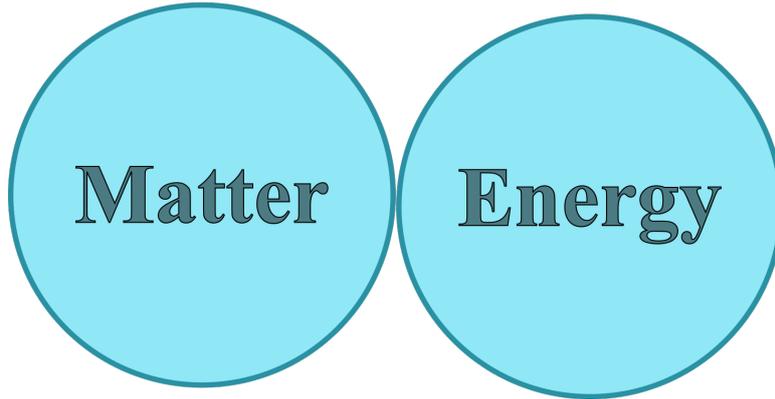

Big Bang Inflation Paradox Essay

短論宇宙霹靂擴張的詭謎

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Space



Universe, topmost superset of {space, matter, energy}
Boundary of the space can not be detected

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Big Bang Inflation Paradox Essay
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Abstract

The cosmic radiation redshifts detected have been interpreted as the result of expanding universe and many mind-boggling confusions.

In fact, Doppler blueshift detection is terminal event. It will terminate and switch to redshift at zero meridian of observer. This makes Doppler effect of redshift dominant, over 92%, under the conditions of no signal loss and observer has perfect vision, not 50-50 linear assumption. Besides, only a very small portion of objects detected has frequency redshift, about 1.1% shown in NASA/IPAC Extragalactic Database (NED). I doubt that we have sufficient information of hastening the fate of the universe and it's past.

Additionally, Doppler redshift is independent of the location of it's source. It is function of changing in distance. So is Doppler blueshift (negative redshift). In other words, redshift caused by receding of an object is Doppler effect. It is the effect of changing distance and it is limited by the top speed of the object.

Secondly, redshift is also an effect of location due to frequency loss over distance (other than change in distance). All signals fade over distance. It also causes stretching frequency due to weaken or lost wavelets. It is positively proportional to the location (distance, not changing in distance) of source object. And, it can exceed z -value greater than one with no limit. However, it is not the light speed receding of Doppler effect. This nature of greater redshift over distance fits the distribution of NED's survey. I would say the z -value detected by NED is redshift caused by combined effects of fading and changing in distance, or signal loss and Doppler. The significance of signal fading in cosmic scale can not be neglected. Radiation detected is not a single wavelet, but a very long stream of wavelets (pulsations or cycles of oscillation). If there was no weaken or loss of wavelets, many stars would be brighter than our Sun? Fading over distance is fundamental. The truth is, any exceed energy of an object will radiate into it's environment and thin out. I believe radiation can continue to stretch to below visible range and beyond detectable over space. This is the only cause of run-away redshift effect.

Thirdly, energy level change of source also can cause stretching or shrinking of frequency and change of strength (amplitude). We assume it does not significantly affect radiations, since original emitting frequency of cosmic source is also an assumption.

Other interpretations of universe expansion are also questionable logically. The motion of objects is independent of it's play field. The size and change in size can not be determined unless we can measure the boundary of the universe. We can not say the Solar Systems is expanding if all objects are moving apart, only if the boundary of the Solar System is extending. To prove the universe is expanding, we have to measure it's boundary. However, space can not have boundary. Otherwise, it would separate space from something else outside. In any way, the boundary of space and something else outside can only be *space*. Thus, space and the universe can only be considered infinite. Logically, we can not detect vacuum, or emptiness. We can only detect the absence of detectable. Absence of detectable is not absolutely equal to emptiness. The same logics that we can only prove the absence of detectable matter and energy. It is impossible to prove the absence of space.

Neither, can we linearly revert the universe had started from a very high density and high temperature state based on the receding objects. Suppose the Solar System was proven expanding, it is not absolutely linearly related to the origin of the Solar System. Seeing all people leaving the ball park doesn't mean they were all born in the ball park. Certainly, it is not the definition of expanding park. Besides, how the state of very high density and high temperature begins? Can chasing the beginning of beginning of the universe ever reach the beginning? Isn't it also paradoxical?

Nevertheless, the size of the universe is defined by it's boundary, not the separation and congregation of objects. Unless the boundary of the universe can be detected and measured, size or change in size of the universe can not be proven. Even if proven all receding galaxies, it is irrelevant to the size of the universe and it's origin. Furthermore, it is impossible to date the age of the Universe, unless we could date the age of fundamental elements. Even if we could date fundamental particles, it is impossible to date the space. How could interpretations of big bang and universe expansion based on small number of redshift survey mushroomed into many such mind-boggling, if not illogical, confusions?

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1 Introduction

The cosmic radiation redshift detection has been interpreted as the result of expanding universe and many mind-boggling confusions. From single point of origin, expanding universe or space with the exception of inside space of galaxies, dark energy/matter, folding space, where was black holes at the time, etc.

Wouldn't all things created by big bang bear one intrinsic momentum of moving apart from each other? Were there something to counteract the flying apart? Could mass meet and build structures while flying apart? Could galaxy move, at many times of light speed by itself? Or, how could it ride on expanding space unless space had surface and friction? Then, how could space expand faster than speed of light? If space did not exist before and it is expanding, how you detect the absence of space and it's expanding? Could primeval atom exist before space? Can we squeeze two protiums into a single point with no space to keep it, let alone all mass and energy of the universe? From our real world observation of the Sun and nuclear fusion, it explores vast energy and fuses into larger mass if we keep hydrogen atoms too close together. Isn't it too close for comfort for all particles we see? How could universe come to exist with such conflicting heritages?

Anyway, what if the hypothesized gravitational waves, spacetime curvature, dark matter, and dark energy got in the way. Isn't it paradoxical entanglement? Can the interpretation of big bang and universe expansion based on redshift be fundamentally sound?

Isn't it time to pause our expansion of theories and reexamine the logics of all underlying assumptions, when mind-boggling statements arise further mind-bending interpretations? I don't think it would harm the theories and the universe if really it was running away. However, great damage could be inflicted on science as well as mankind if we refused to fix errors and let them grow into uncorrectable mistakes, isn't it?

2 Illusion Caused By Radiation Redshift

Firstly, Doppler redshift[1] of radiations is dominating in all observations, Figure 1, Figure 2, and Table 2.[3]

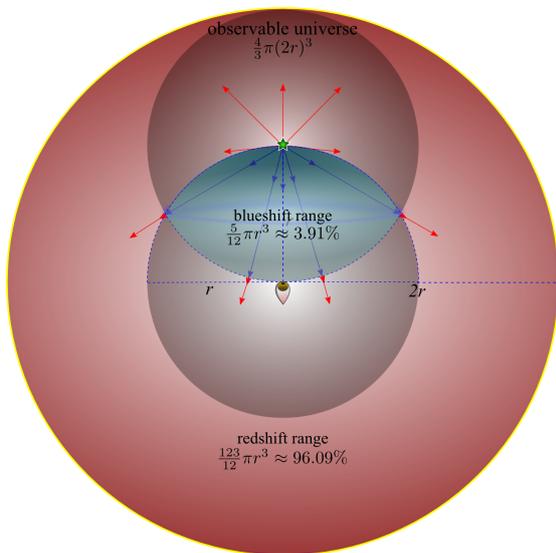


Figure 1: Dominating Cosmic Doppler Redshift

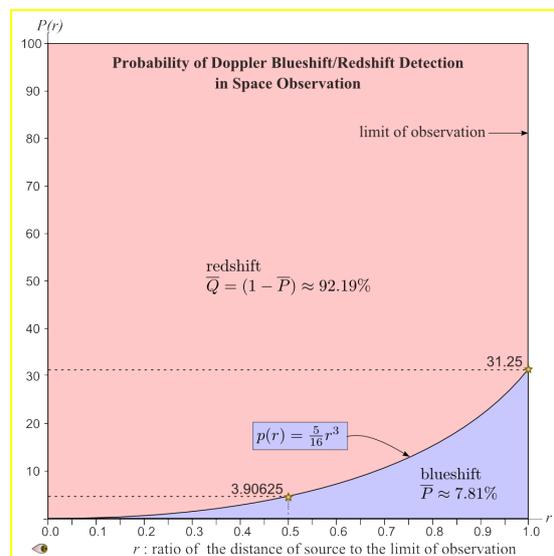


Figure 2: Probability Distribution of Doppler Effect in Space

Probability of Doppler Blueshift Detection at Location r , ($0 \leq r \leq 1$)

Blueshift Detection	Probability Function $p(r)$	Population Mean (%)	Mode (%)	Range (%)
Space	$\frac{5}{16}r^3$	7.81	31.25	0.00 – 31.25
Surface	$\left(\frac{2\pi}{3} - \frac{\sqrt{3}}{2}\right)\frac{r^2}{\pi}$	13.04	39.10	0.00 – 39.10
Linear	$\frac{r}{2}$	25.00	50.00	0.00 – 50.00

Table 1: Blueshift Probability Functions

Probability of Doppler Redshift Detection at location r , ($0 \leq r \leq 1$)

Redshift Detection	Probability Function $1 - p(r)$	Population Mean (%)	Mode (%)	Range (%)
Space	$1 - \frac{5}{16}r^3$	92.19	100	68.75 – 100
Surface	$1 - \left(\frac{2\pi}{3} - \frac{\sqrt{3}}{2}\right)\frac{r^2}{\pi}$	86.96	100	60.90 – 100
Linear	$1 - \frac{r}{2}$	75.00	100	50.00 – 100

Table 2: Redshift Probability Functions

$$r = \frac{\text{distance of observation}}{\text{limit of observation}} = \frac{\text{distance of object}}{\text{observable universe}}$$

Doppler effect is independent of the location of it's source. It is function of distance change (speed), and limited by the top speed of the source and observer. Faster receding object at any location, near or afar, will have higher Doppler redshift. Slower receding object will have lower Doppler redshift irrelevant to it's location. The same principle applies to Doppler blueshift. Doppler redshift predominates over Doppler blueshift by far. Doppler blueshift switches into redshift when passed the observer.

Secondly, redshift is also caused by frequency and amplitude loss over distance (other than change in distance). All signals fade over distance by propagating into the environment. It is location dependent. Radiation detected is not a single wavelet, but a very long stream of wavelets. Here, wavelet is defined as single complete cycle of oscillation (period). The size of light wavelet is brightness, the rate of arrival (frequency, pulsation) is color. The size of sound wavelet is loudness, the rate of arrival (frequency) is pitch. In music, you hear middle C if your ears detected 261.63 sound wavelets (oscillation of air molecules) within one second, or 130.815 sound wavelets in one half of a second.

Nature does not create perfect wavelet and identical wavelets. Weak wavelets will not survive in long journey. Lost wavelets will stretch frequency and cause redshift, Tyndall effect[7]. Fading over distance is fundamental. Emitted radiation of an object will radiate into it's environment and thin out. It is exponentially proportional to the distance of source object. It can create redshift effect z - value greater than one with no limit. However, it is not the light speed receding of Doppler effect.

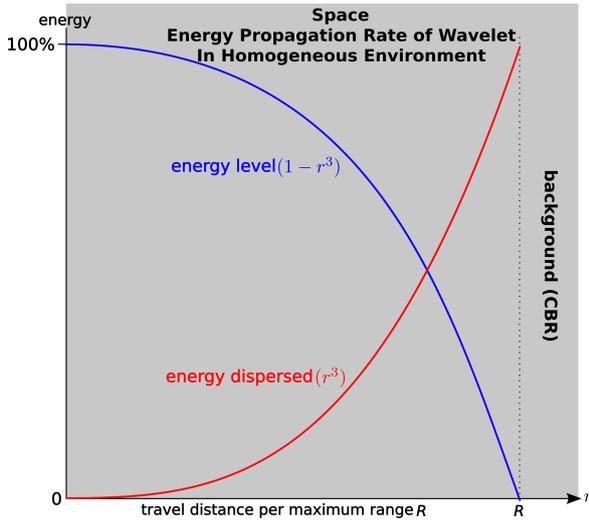


Figure 3: Path Loss in Space

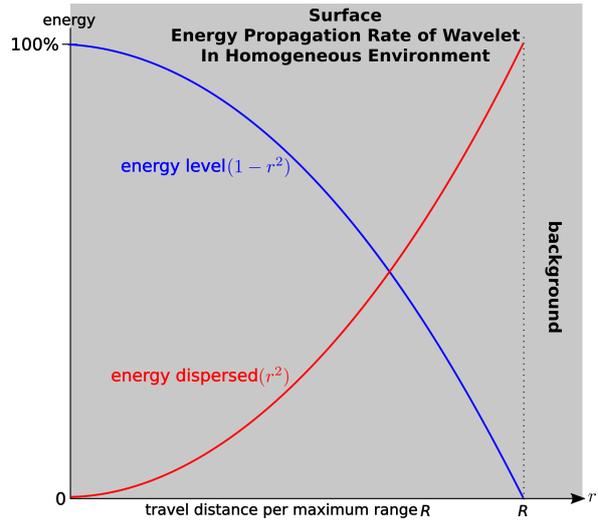


Figure 4: Path Loss on Surface

Additionally, Doppler blueshift will not be detected if frequency loss overwhelmed Doppler effect. It also reduce the possibility of Doppler blueshift detection exponentially over distance. I believe frequency loss over distance has caused the interpretation of Hubble's Law,[5], however, created the illusion of run-away universe.

High frequency radiation stands out from low frequency background. It lets us detect the location of source easier. Low frequency, radiation on the other hand, is harder to pinpoint the location. It is the same phenomenon of low frequency music is non-directional to our ears. I believe radiation, over space, can continue to stretch below visual, then, under infrared detection, the source would merged into the background. The result is infinite redshift effect of ($z = \infty$). The question is, can we measure redshift of below-infrared or Cosmic Background Radiation (CBR) and locate the source?

Thirdly, energy level change of source also can cause stretching or shrinking of frequency and amplitude to change. We assume it does not significantly affect radiations, since original emitting frequency and strength of cosmic source are assumption.

Fourthly, this nature of greater redshift over distance fits the distribution of NASA/IPAC Extragalactic Database (NED).[6] I would say the z -value detected by NED is redshift caused by combined effects of fading and changing in distance, or signal loss and Doppler effect. However, only under 1.1% of the surveyed objects with redshifts are detected, Table 3. Can we say the total objects surveyed is more than a drop of ocean water comparing to the size of cosmos? Besides, the period of sky survey is hardly a blink of our eyes. I doubt that it has any significance of hastening the fate of the universe and it's past.

Objects found in NED's list, November 2, 2014		
redshift objects ($z > 0$)	5,166,694	1.097%
blueshift objects ($z < 0$)	9,334	0.002%
marginal objects ($z = 0$)	2,939	0.001%
Total objects with redshifts	5,178,967	1.100%
Total objects without redshifts	465,814,004	98.900%
Total objects found	470,992,971	100.000%

Table 3: NASA/IPAC Extragalactic Database (NED)

Fifthly, Milky Way and it's neighboring galaxies are located in remote region of the universe, not center of the universe¹. However, let alone faster than the speed of light; we don't detect it is receding; neither the inner space of Milky Way nor Solar System is expanding. There is no logical, physical, and scientific ground to make exception of Milky Way and it's neighboring galaxies.

Space is the environment of all objects. It is illogical to assume space is capable of action. Suppose it could, nevertheless, expansion of space would cause all objects to react; galaxies had to expand when outside had expanded; it also caused the temperature of the surrounding to drop; Solar system had to expand when galaxy expanded; and temperature drop; then, planets have to react to the change; we had to feel the weather; the reaction would continue down to fundamental level. It is universal principle of outside pressure change we all can observe.

Finally. Suppose there were alien observers on opposite galaxies with redshifts ≥ 1 detected by us. They too had to detect the identical redshift of Milky Way. Do you think they would conclude that Milky Way is receding past the speed of light in expanding universe? Anyway, what if the hypothesized gravitational waves, spacetime curvature, dark matter, and dark energy got in the way. Wouldn't it be paradoxical entanglement?

To me, redshift distribution of NED does not suggest more than it's face value, *i.e.* estimate of distance and change in distance of cosmic object. However it has been over-interpreted to be the evidence of origin, big-bang, expanding, and age of the universe along with further mind-boggling interpositions.

3 Disprove Expanding Universe

In order for space to expand these assumptions ought to be true:

1. Space can expand and there is room for it to expand.
2. Space can expand faster than light-speed.
3. Space can carry, or it has friction to carry all structures as large as galaxies.
4. Expanding space does not impose accelerating stress on riding structures.

Do you believe any of these can be proven? Still, none of this matters if redshift was not over (even mis) interpreted, isn't? And, further controversial interpretations can be avoided.

Radiation, blinking light, sound, wave, and all oscillations are pulsations. So is the pulsation of quasar. The Doppler effect of pulsation from a quasar has to coincide with Doppler effect of radiation. It is also true that Doppler effects of sight and sound of a moving singer will coincide. And it is universal.

However, we have observed constant rate of pulses from high-redshifted quasars. The study of astronomer Mike Hawkins[2] from the Royal Observatory in Edinburgh has found that quasars give off light pulses at the same rate regardless of their distance from the Earth.

Pulses of quasar is intensive burst (frequency). It will not suffer path loss of amplitude and frequency as much. It tells better truth about Doppler effect. To me, quasars are broadcasting strong and clear messages

¹Sounds familiar isn't it? The truth is, the data collected by cosmic observation is centered around the observer. Isn't it an illusion?

saying that they are not leaving.

4 Illusion of Expanding Space

Galaxies are very far away, but space is right here in our hands and everywhere around. However, it's impossible to bent, stretch, compress, or doing anything with it. Bending a sheet of paper or pizza has nothing to do with the space. Rising ball of dough will not carry chocolate chips if they are not attached, or no friction between dough and chocolate chips. Blowing up a balloon does not make the space larger or smaller. Neither space has changed when the balloon is popped. Shipping countless sealed or unsealed containers from Shanghai to Los Angeles can never take the space from China to California.

Logically, we can not detect vacuum, or emptiness. We can only detect the absence of detectable. Absence of detectable is not absolutely equal to emptiness. Even if the best telescopes only see the darkness in a region of space, it is not absolutely empty or the edge of the space is reached. Darkness is not emptiness. Absence of matter is not absence of space. We can not detect the boundary of space. Neither can we detect the surface or shape of the space that is right in our hands. The same logics that we can not detect the absence of space. It can only be considered infinite. We have learned to manipulate matter and energy since our first existence on Earth, never space. It is the absolute complement of the physical universe. To me, it is impossible to subscribe the idea of bending space. It can not be disturbed, otherwise there would be no peace in universe.

Even it is impossible to study space hand-on. However, there is vacuum that shares many properties of space. Fortunately, we can create and shape vacuum to an extent. By isolating matter and energy, we can create man-made vacuum that is observable. When matter and energy are absent, the important nature of space would surface.[4]

4.1 Space, Mass, and Force

Here, we repeat the famous Galileo's experiment with a ball and a dandelion seed free-falling in a vacuum chamber, Figure 5. It shows, in gravity field, falling objects would fall with uniform acceleration in vacuum, regardless of their shape, size, or compositions. Or, gravitational acceleration is independent of mass, shape, size, surface, and distance. The truth is, a simple experiment since centuries ago tells more than just gravity.

Even the ball and the seed have structure and surface, and both are capable of surface interactions. However, vacuum would not disrupt the fall. The ball and the seed will descend in identical acceleration and land at the same time. It shows the truth that the vacuum has no friction. It also shows the reverse truth that the ball and the seed (mass) and the motion of mass can not disturb vacuum. Here we summarize the properties of vacuum:

- It has no mass,

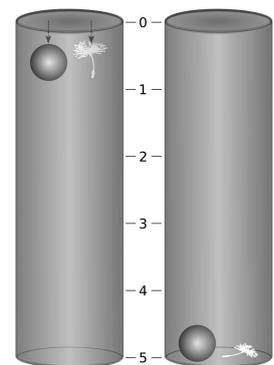


Figure 5: Free Fall in Vacuum Chamber

- contains no energy,
- actionless or absolute zero,
- frictionless or zero viscosity, and
- incapable of any interaction.

The nature of vacuum basically is the property of absence, or emptiness. The fact is, even vacuum can not exist without space. Nevertheless, space also posses the property of absence. It also shows the fact that the space would not alter the fall, it is also frictionless, and neither does it have surface and it is unable to interact. We can consider space is analogous to an infinite vacuum, and vacuum the window to view the nature of space.

Additionally, all invisible stuffs inside the chamber, *e.g.* hypothesized dark matter/energy (I don't see why not, since it is so much of them.) would have to be independent. Anything inside the chamber will not disrupt the fall. In other words, space, vacuum, invisibles, and dark matter/energy, if existed, are independent of the motion of the ball and seed (mass). Reversely, mass and motion of mass will no disturb space and vacuum. Note that it is gravity powers the fall. It also means that ***gravity can wave mass, but vacuum and space can not be disturbed by gravity.*** In light of this, ***what really are gravitational wave and geodetic effect?***

4.2 Displacement of Space Paradox

Suppose we do the same experiment in zero gravity field by shifting the chamber, as depicted in Figure 6:

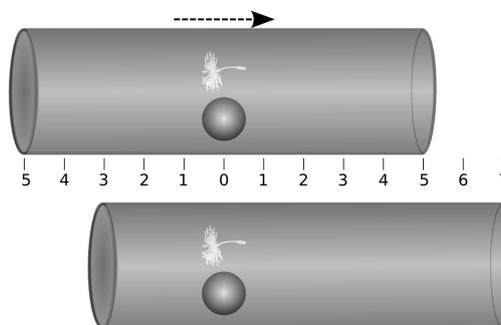


Figure 6: Shifting Vacuum in Zero Gravity Field

Here, vacuum has shifted with the chamber, however, the result can only be the same as in gravity field, the ball and the seed would not move along. The motion of vacuum would not disturb the ball and the seed as long as there is no physical contact. I would say neither the vacuum nor the space will carry objects, and space remains independent of all objects and actions, even the displacement of vacuum. The argument of dark matter/energy also applied here.

Figure 7 is an animated illustration. Please note that some PDF viewer might not display it properly.



Figure 7: Vacuum Chamber in Zero Gravity Animation

4.3 Expansion of Space Paradox

Next, suppose we have a vacuum cylinder equipped with piston, as depicted in Figure 8.

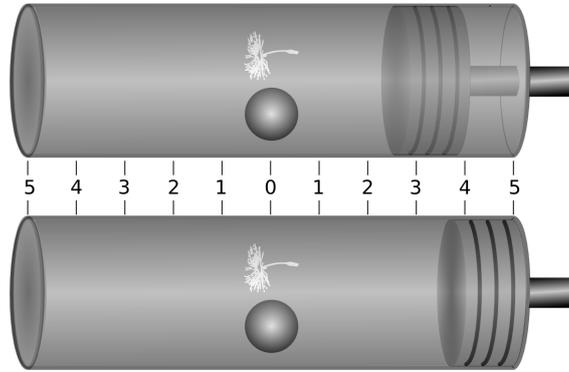


Figure 8: Expanding Vacuum in Zero Gravity Field

Here we can compress or expand the volume of vacuum with this device. However, neither the compression nor the expansion of vacuum would displace the ball and the seed, as long as the piston does not come in contact with the ball and the seed. In this experiment, I would say neither space is capable of displace object, nor the space has been compressed or expanded. The same argument of dark matter/energy also applied.

Figure 9 is an animated illustration. Please note that some PDF viewer might not display it properly.

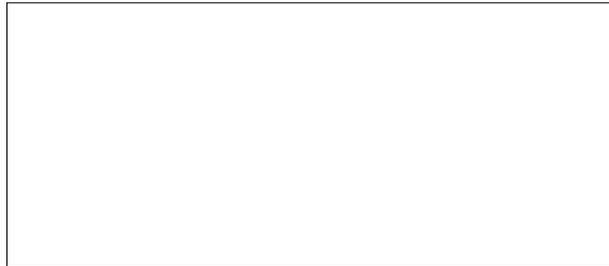


Figure 9: Vacuum Cylinder in Zero Gravity Animation

Nevertheless, if galaxies want to separate from each other and accelerate away faster than the speed of light, they are on their own. Space would not help.

5 Motion of Objects VS. Background

We can only say the background of all objects and activities of the universe is space. It's independent from any object and activity anywhere. The motion of the objects has nothing to do with the space. The size and change in size can not be determined unless we can measure the boundary of the universe. The same logics that we can not say the Solar Systems is expanding if all objects within are moving apart. Only if the boundary of the Solar System is extending. It is also true that out-moving all objects and evacuating all residents would not make larger city. Without the boundary adjustment, if agreed by all neighbors or by natural, the size of the city can not change. So is seeing all people leaving the ball park does not mean the ball park is getting larger.

Neither, can we linearly revert the universe had started from a very high density and high temperature state based on the receding objects. Suppose the Solar System was proven expanding, it is not absolutely linearly related to the origin of the Solar System. Seeing all people leaving the ball park doesn't mean they were all born in the ball park. Besides, how the state of very high density and high temperature begins? Can chasing the beginning of beginning of the universe ever reach the beginning? Isn't it also paradoxical?

Under the same argument, we can also assume that all objects of the universe were built at all regions first. Then, there was a deflation to congregate the universe into a very high density and high temperature state before the Big Bang and inflation. Hence, the cycle of heartbeats of the universe. Even so, it only describes the rhythm of the objects, not the size change of the universe.

6 Get Down To The Foundations

Universe is defined as the topmost superset that includes everything that exists anywhere.

$$Universe = \{space, matter, energy\}$$

Space

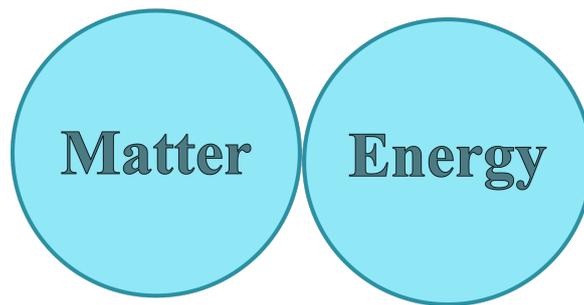


Figure 10: Universe, topmost superset of {space, matter, energy}

Matter and energy are considered finite, since their volume and boundary can be measured, shown enclosed in Figure 10. Contrarily, space can not have boundary. Otherwise, it would separate space from something else outside of the space. Neither the boundary or surface of the space nor the outside of the space can be defined as anything other than space. Hence, space, boundary of space, and the outside can only be *space*. Thus, the shape, size, surface, and boundary of the space can not be detected or measured. Neither the age of the space can be measured. Space and the universe can only be considered infinite.

By the way, isn't it redundant to create any set higher than this Universe? Real or imaginary twin, multiplet, and parallel are all possible in this Universe. I don't see anything that this Space disallows to exist. Nevertheless, what is the play-field for parallel universes, SPACE? What is the super set of parallel universes, UNIVERSE? Isn't it endless chase of over-stretched imagination?

7 Summary

- Radiation redshift is the combined effects of:

-
1. Change of observation distance. It causes Doppler effect. It is independent of the location of its source. It is function of distance change (speed), and limited by the top speed of the source and observer. Faster receding object at any location, near or afar, will have higher Doppler redshift; So is Doppler blueshift. Doppler redshift predominates over Doppler blueshift by far. Doppler blueshift switches into redshift when passed the observer.
 2. Amplitude and frequency loss over distance. It causes stretching frequency due to weakened or lost wave periods by absorption of the environment. It is location dependent. It does not create blueshift. It is exponentially proportional to the distance of source. And, it can create redshift effect of z -value greater than one with no limit. I believe it has caused the interpretation of Hubble's Law, however, created the illusion of run-away universe.
 3. Energy level change of source also can cause frequency and amplitude to change.
- Path loss of amplitude and frequency will continue below visual then infrared and merge into Cosmic Background Radiation (CBR). The result is infinite redshift effect of ($z = \infty$).
 - Constant rate of pulses from high-redshifted quasars is observed. Pulsation is frequency. Its Doppler effect has to coincide with the radiation of quasars. Pulsation of quasar is intensive bursts. It will not suffer path loss of amplitude and frequency as much. It shows better truth of Doppler effect. Constant pulsation of quasar tells the fact that it is not receding.
 - Redshift is relevant to the location and change of location of an object. It has nothing to do with the size and size-change of the universe, or background.
 - The size of the universe is defined by its boundary, not by the separation and congregation of objects. Even if proven all receding galaxies, it is irrelevant to the size of the universe and its origin. Unless the boundary of the universe can be detected and measured, size or change in size of the universe can not be proven. Even so, size of the universe remains independent of its origin.
 - Space and the universe can only be considered infinite. It is impossible to bend or expand infinite space that has no surface and boundary.
 - Furthermore, it is impossible to date the age of the Universe, unless we can date the age of fundamental elements. Even if we could date fundamental particles, it is impossible to date the space.

To me, it is obvious that very majority of radiations is lost over distance. Otherwise, sky will be filled with visible light and all other radiations. The dominating and exponential natures of radiation redshift do not suggest acceleratingly physical departure of all astronomical objects, neither inflation nor a common origin. Universe will continue as is, no extra matter and energy needed. Otherwise, besides the demand for run-away energy/matter; the interactions among ordinary energy/matter and run-away energy/matter; and acceleratingly expansion demands accelerating energy/matter; and on. It can only lead to run-away interpretations.

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