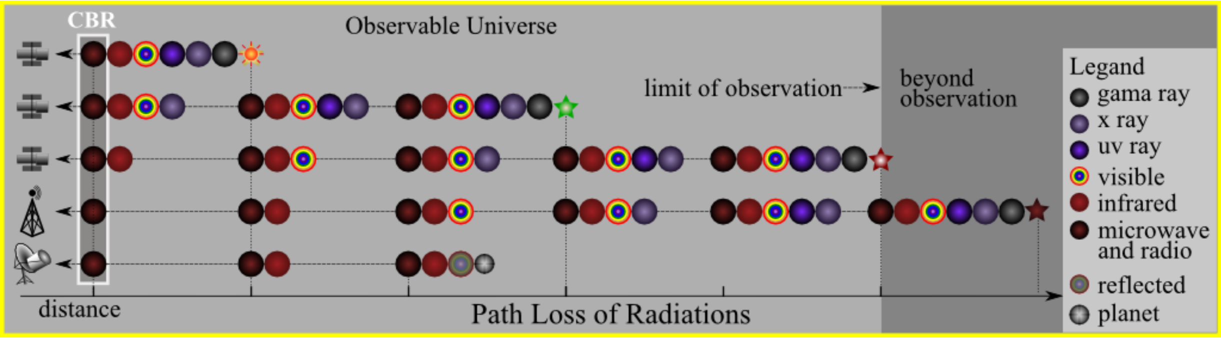
Age of The Universe Paradox

宇宙年龄的矛盾

Cres Huang



Dominating Low Frequency Detection (CBR)
Proportional High Frequency Loss Over Distance

ISBN 978-957-43-2732-4

Age of The Universe Paradox

Edition: 2015(01)-preview
2015/08

Advice and correction are appreciated.
Please send your correspondence to:
cres@mail.org

Abstract

Many attempts of estimating the age of the universe are advocated. However, it is hard to believe the estimates have any solid support. We understand there is recycle fundamental of the universe. The questions are:

- Will there be any trace left when a star system is completed recycled from the fundamental elements?
- Are we capable of detect such trace?
- Can we estimate the age of fundamental element?
- Is space older than matter and energy?
- Does space age differently in different locations?
- How to judge the age of space?

I expect there are stars too far and too dim for us to detect their trace of visible radiations. I also expect there will be countless nomad planets and small objects out there. They are very likely to outnumber the stars by far. All objects emit radiations, but not necessary within the capability of our best detector.

I would not say we have found the oldest and furthest object in the universe. Could we say how old the universe is? It seems that the age of the universe is determined by the size of our telescope. Nevertheless, to joint the club, this article studies the logic of estimate based on the redshift survey of electromagnetic radiations, NASA/IPAC Extragalactic Database (NED).

Contents

List of Figures

List of Tables

1 Introduction

Many attempts of estimating the age of the universe are advocated. However, it is hard to believe the estimates have any solid support. We understand there is recycle fundamental of the universe. The questions are:

- Will there be any trace left when a star system is completed recycled from the fundamental elements?
- Are we capable of detect such trace?
- Can we estimate the age of fundamental element?
- Is space older than matter and energy?
- Does space age differently in different locations?
- How to judge the age of space?

It seems that the age of the universe is determined by the size of our telescope. Nevertheless, to joint the club, this article studies the logic of estimate based on the redshift survey of electromagnetic radiations, NASA/IPAC Extragalactic Database (NED).

2 Probability Function of Doppler Effect

Doppler blueshift detection is terminal event. It would terminate and switch to redshift at zero meridian. On the other hand, redshift could continue beyond the limit of observation. This nature of Doppler effect makes redshift detection dominating in all observations. Certainly not 50-50 redshift to blueshift linear assumption of some theories.

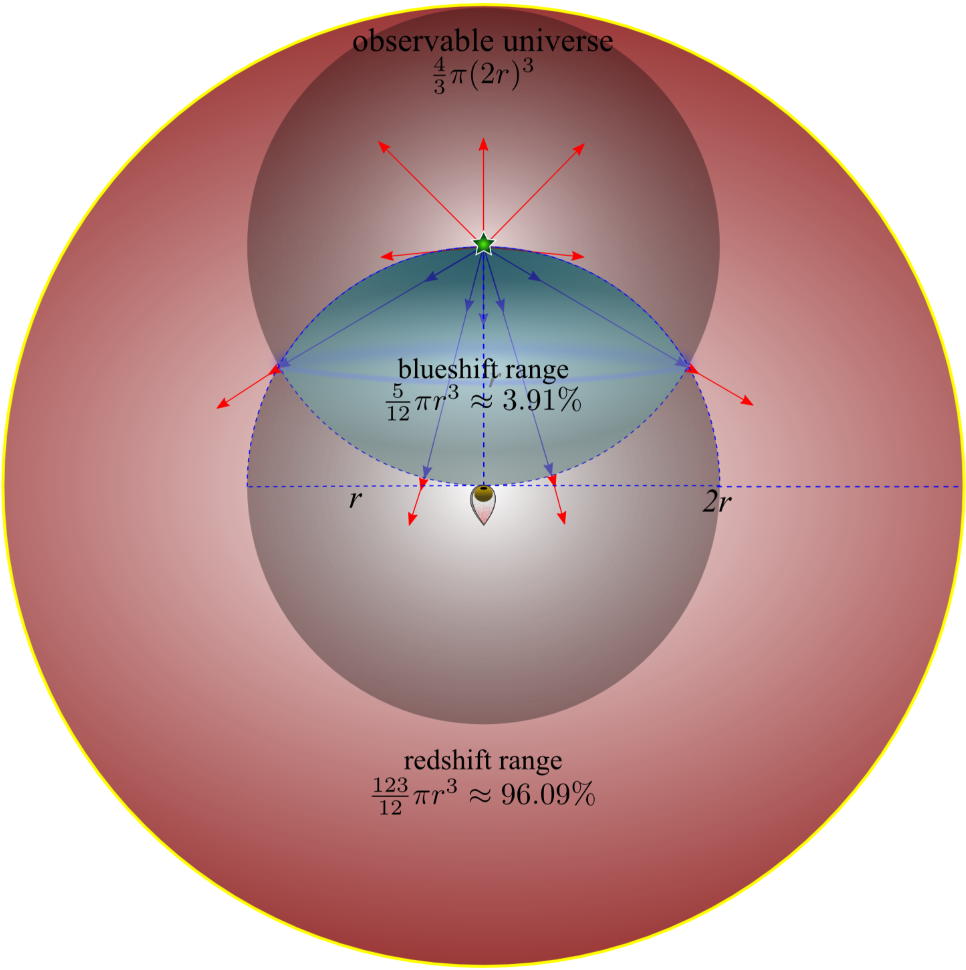


Figure 1: Dominating Doppler Redshift Detection in Space Observation

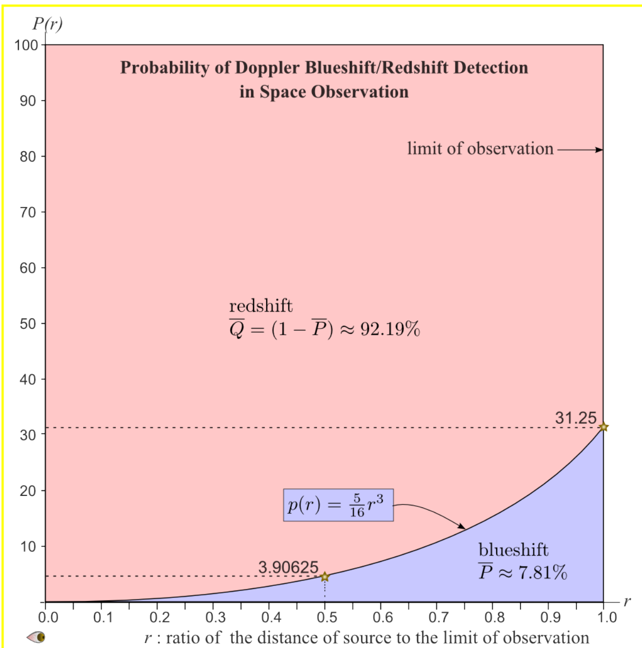


Figure 2: Probability Distribution of Blueshift Detection in Space

The mathematic proof is published in my study “From Redshift To Cosmic Background Radiation”[1].

3 NED's Redshift Survey Database

Let's do a quick look of the redshift survey in NASA/IPAC Extragalactic Database (NED).

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 1: NASA/IPAC Extragalactic Database (NED)

If we only compare the objects with redshifts:

Objects with redshifts		
redshift objects ($z > 0$)	5,166,694	99.763%
blueshift objects ($z < 0$)	9,334	0.180%
marginal objects ($z = 0$)	2,939	0.057%
Total objects with redshifts	5,178,967	100.000%

Table 2: Redshift Objects (NED)

The spiral trajectory of observer gives very little change of fixed distance of observation, and next to zero in long run. The 2,939 ($z = 0$) objects are assumed marginal, and it will become clear in follow-up observation. The possibility can be one of the these:

1. Passing-by blueshifted objects (incoming object near the zero meridian, or perihelion, from the observe). They will show redshift in follow-up observation.

2. Redshifted objects at returning orbit (departing object at the far-end zero meridian, or aphelion, from the observe). They will show blueshift when curve back to an adequate distance in follow-up observation.

3. Inadequate detection by various causes.

However, it is expected that 92.19% of these 2,939 objects will shown redshift ($z > 0$) in follow-up observations. Despite the objects with redshifts is only a very small portion of the total objects found, the high count of redshift ($z > 0$) comparing to blueshift ($z < 0$) confirms the dominating nature of redshift.

Noted that Doppler effect is depending on the velocity not the location of the object, detected Doppler redshifts do not have to be proportional to the distance. However, NED's observation shows the positively proportional distribution of redshifts. It suggests something else more than just Doppler effect.

The very large objects without redshift, 465,814,004, is assumed inadequate detection. The distance of celestial observation can only be considered changing constantly. There will always be Doppler effect ($z \neq 0$) despite it can be beyond detection. Inadequate detection can be the result of interference of the environment and the capability of our technology of detection. Even if we ignore this very high portion (98.9%) of objects without redshifts, but, it is also expected that 92.19% of them will have ($z > 0$) when it can be obtained.

On the other hand, only 1.1% of objects with redshifts are detected, I doubt that we have sufficient information of hastening the fate of the universe and it's past.

4 Estimate Age of The Universe Based On NED Database

Suppose NED's information (Section 3) is obtained with perfect vision and no signal loss. The percentage of blueshift detected from NED is:

$$\begin{aligned}\overline{p}(r) &= \frac{\text{blueshift objects}}{\text{Total objects accounted}} \\ &= \frac{9,311}{4,204,329}\end{aligned}$$

From equation $P(r) = \frac{5}{16}r^3$, we can estimate the distance ratio(r):

$$\begin{aligned}\overline{r} &= \sqrt[3]{\frac{16}{5}\overline{p}(r)} \\ &= \sqrt[3]{\frac{16}{5}\frac{9311}{4204329}} \\ &\approx 0.1920805\end{aligned}$$

Then, we only have reached to 0.1920805 of the universe at the distance of 13.2 bly (billion light years) set by Hubble Ultra Deep Field (HUDF)[2]. To estimate the radius of universe in terms of NED's database, the radius will be larger than 68 bly ,

$$\frac{13.2}{0.1920805} \approx 68.7211989$$

The lower limit of HUDF is near infrared. The rough estimate here is merely the minimum visible part of the universe we can detect. It is based on the radiation activities above infrared.

However, the sky is filled with long reaching lower frequencies, (Cosmic Background Radiation, CBR). The issue is, can we ignore the sources and locations of these radiations?

5 Cosmic Background Radiation

So far, the limit of observation is defined as the furthest distance we can reach in visual aspect. Currently 13.2 billion light years (bly) set by Advanced Camera for Surveys (ACS) and the Near Infrared Camera and Multi-object Spectrometer (NICMOS) of Hubble Ultra Deep Field (HUDF).

Low frequency radiations beyond HUDF's reach are not entirely undetectable by us. Since they can travel longer distance, low frequency radiations from objects beyond the visual detection of 13.2 bly can arrive. They can be detected in the range from microwave down to ultra long radio wave when we listen. It will be detected as Cosmic Background Radiation (CBR), as depicted in a simplified illustration in Figure 3.

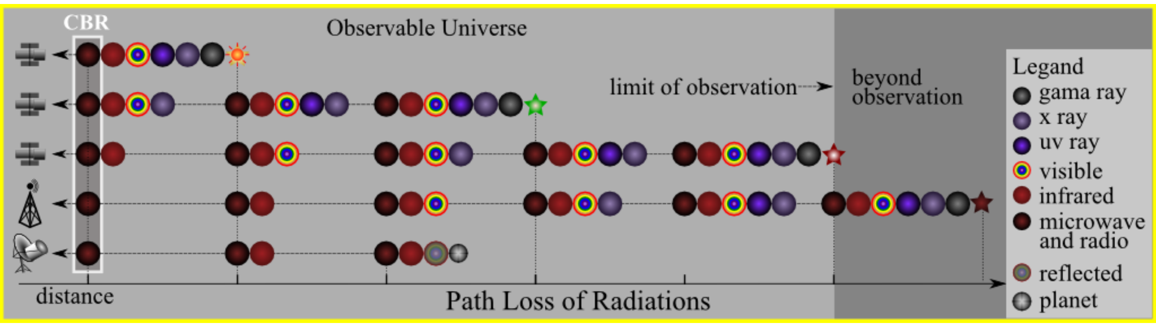


Figure 3: Cosmic Background Radiation (CBR)

In order to fill the space with radiations from all directions around an observer, the sources have to be distributed in all locations. Radiation is directional unless is reflected or deflected. In real life, a single source can not send the sound to a listener from more than one direction unless it is echoed. To hear it from all directions, it has to be echoed back (if not absorbed) from all surroundings. It is hard to believe a single source of radiations (Big Bang) can filled the universe from all directions. There was nothing in surroundings to reflect or deflect the radiations. Even if the remnant of Big Bang is still observable today, it has to continue to fade when the source does not exist any longer. However, I do not believe there is evidence showing CBR is fading.

The universe is not mute, but rather noisy. Electromagnetic radiations across the whole spectrum are creating constantly in all locations by all objects. I will not assume planets mute even they do not generate visual radiations. High and low radiations shall come from all objects, large and small, constantly. I expect there will be Doppler effect of Cosmic Background Radiation (CBR) if we can identify the source of the radiations and the original emitting frequency.

Very visual creatures of us love the stars, however, I believe the number of planets and planetoids can outnumber stars by many folds; Since it takers less material, energy, and time to construct small structure. Lack of high energy activities, they will not emit the full spectrum of radiations like stars, however, they will emit their own and reflect radiations from stars near-by.

Nevertheless, I believe redshift will not end at infrared. It can continue to be stretched or propagated further to microwave, short wave, and ultra long wave until all energy has been dispersed into the environment, however, not completely flat-line (absoluter zero). Due to the larger population of sources, low frequency radiations will fill the sky from all directions and distances we listen. This phenomenon will surround any observer, Earthing or alien, at any location in the universe.

I believe Figure 3 shows a logical explanation of CBR. It is an ongoing event of the universe. Other has passed, some is here, and more is coming. The generation of CBR will never end, or last as long as there is activity in the universe. Isn't it the same phenomenon of background noise created by all activities in and outside of a city?

6 Can We Really Tell The Size & Age of The Universe?

I don't believe redshift will stop stretching at infrared. Despite we are unable to identify the source, low frequency radiations from outside of the detectable universe can arrive.

Considering the all-encompassing CBR, and the long reaching able of low frequencies; much larger universe is not exaggeration logically. The question is, will we ever know if there are objects outside of the detectable universe radiating in wave length longer than CBR? We only measure the universe with visual radiations. Doesn't it seem that the age of the universe is determined by the size of our telescope? Nevertheless, there are activities of elementary particles which can not be detected by us? Isn't' it impossible to picture how far some active objects, say neutrinos, can be other than infinite.

Furthermore, suppose we have perfect telescope that is limitless in range; And, we don't see anything when we look pass all objects; Can we say we have reached the edge of the Space or Universe? Or, there is infinity beyond Space?

On the hand, can we really say how old it is? Since inaction is also action (or an event of inactivity), can we say there is no universe even there is no activity in it? Complex structure records more describable history in it's recycle circle. However, there is no trace left in recycled fundamental elements. Can we really tell how old the elementary particle is? Or, there is something older?

Nevertheless, since it is already here undeniably, I accept that the universe has no center and no beginning-ending. Universe can only be observed by anyone of us in very short blink. I will take the universe as is; rather than chasing my tail, or back of my head.

7 Appendix II: Accumulated Probability Distribution

Table 3: Accumulated Probability Distribution of Blueshift Detection, P(r)

r	(%)	r	(%)	r	(%)
0.00	0.00	0.01	0.00000008	0.02	0.00000128
0.03	0.00000641	0.04	0.00002000	0.05	0.00004883
0.06	0.00010125	0.07	0.00018758	0.08	0.00032000
0.09	0.00051258	0.10	0.00078125	0.11	0.00114383
0.12	0.00162000	0.13	0.00223133	0.14	0.00300125
0.15	0.00396564	0.16	0.00513281	0.17	0.00654045
0.18	0.00821949	0.19	0.01020278	0.20	0.01252502
0.21	0.01522279	0.22	0.01833455	0.23	0.02190063
0.24	0.02596323	0.25	0.03056644	0.26	0.03575621
0.27	0.04158038	0.28	0.04808864	0.29	0.05533259
0.30	0.06336567	0.31	0.07224323	0.32	0.08202246
0.33	0.09276244	0.34	0.10452414	0.35	0.11737038
0.36	0.13136587	0.37	0.14657719	0.38	0.16307280
0.39	0.18092303	0.40	0.20020009	0.41	0.22097805
0.42	0.24333287	0.43	0.26734239	0.44	0.29308631
0.45	0.32064620	0.46	0.35010554	0.47	0.38154965
0.48	0.41506573	0.49	0.45074286	0.50	0.48867201
0.51	0.52894600	0.52	0.57165955	0.53	0.61690922
0.54	0.66479348	0.55	0.71541267	0.56	0.76886897
0.57	0.82526648	0.58	0.88471116	0.59	0.94731083
0.60	1.01317520	0.61	1.08241585	0.62	1.15514624
0.63	1.23148169	0.64	1.31153942	0.65	1.39543851
0.66	1.48329991	0.67	1.57524646	0.68	1.67140285
0.69	1.77189568	0.70	1.87685339	0.71	1.98640633
0.72	2.10068668	0.73	2.21982855	0.74	2.34396787
0.75	2.47324250	0.76	2.60779212	0.77	2.74775832
0.78	2.89328456	0.79	3.04451617	0.80	3.20160035
0.81	3.36468619	0.82	3.53392464	0.83	3.70946854
0.84	3.89147259	0.85	4.08009336	0.86	4.27548933
0.87	4.47782081	0.88	4.68725002	0.89	4.90394104
0.90	5.12805982	0.91	5.35977419	0.92	5.59925386
0.93	5.84667042	0.94	6.10219731	0.95	6.36600987
0.96	6.63828530	0.97	6.91920270	0.98	7.20894300
0.99	7.50768905	1.00	7.81406258	r	1/100

References

[1] Cres Huang; *From Redshift to Cosmic Background Radiation*, 2014/11; ISBN 978-957-43-1997-8(paperback); ISBN 978-957-43-2045-5(PDF); National Central Library of Taiwan, http://ebook.ncl.edu.tw.
http://worldlibrary.net/details.aspx?bookid=4023658
https://payhip.com/b/v5am
https://archive.org/details/Redshift2CBRPDF

[2] NASA, *The Hubble Ultra Deep Field*, March 9, 2004.
http://hubblesite.org/newscenter/archive/releases/2004/07

[3] NED, *NASA/IPAC Extragalactic Database*
http://ned.ipac.caltech.edu/

Your advices and corrections are appreciated. Please send your correspondence to: cres@mail.org

ISBN 978-957-43-2732-4
9 789574 327324