

New Prospective of the Space - Time Dimensions of the Visible Universe

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Abstract

No one claims creating the whole universe and everything in it except *Allah* Almighty as had been declared in all holy books especially the *Quran*. So, just trying to comprehend the time and space dimensions of the universe though they are gigantic because they must imply with the unlimited and magnificent power of the Creator himself yet, one must think that both dimensions should still have limitation boundaries and they are not infinite. Scientific gestures from some verses of the *Quran* and correct and verified *Hadeeth* if could be scientifically interpreted correctly it may give us clues about that dilemma and that the answer was there more than 1400 years ago.

Introduction

Since the existence of the mankind on Earth something between one to eight millions years ago. Mankind was, still, and will be fascinated by the universe and its structure. The universe precision, accuracy, and organization are far beyond the limits of any mind. But, the most persistent question in all times is how far is the universe and how old is it? Many theories in that regard were established and discussed the creation and the age of the universe since the **Big Bang** to the present or even deep into future [9]. Here, I am not going to argue about the creation of the universe because it is simply *Creator's* work and not of my concern. But, I am going to discuss the space-time dimensions of the universe, and that the answer was inside the *Quran* more than 1400 years ago. However, in the *Quran* there are confirmation proofs about the **Big Bang** theory, expansion of the universe (Red-Shift phenomena)[4], and even contraction of the universe (Blue-Shift phenomena). But the process of creation itself, how it was

evolved and developed? In my opinion, no one should be involved in that debate because simply we were not there at that time. Moreover, the process of creation is way beyond our senses and our understanding capabilities. No theories what so ever no matter how much there are can describe what happened or even give you a clue, simply because the theory is the outcome of our minds, and our minds have limitations. Even the theory of George Gamow in 1948 [6] which describes the first half hour after the **Big Bang** (the three epochs; ultra-hot, hot, and cooled) is purely speculations and has many doubts about it. Thus, we can't restrict or confine something way beyond our imaginations capabilities such as the process of creation of the universe by our limited thoughts. What we are observing now in the galaxies and star clusters, is the outcome of the process of creation and not the process of creation itself. In the *Quran* and *Hadeeth* there are various indications that universe is limited and have boundaries. Moreover, three or four different *Hadeeth* mentioned that the distance between Earth and the 1st heaven (sky) is a “march for 500 years” and the distance between the 1st sky and the 2nd one is another “march for 500 years”. So, the total “distance thickness” for the 1st sky will be a “march for 1000 years”, and there are 7 heavens (skies/or universes) between any two successive skies there will be 1000 years.

Analysis

Universe Time Dimension

In trying to understand the significant meaning of the number 500 years pointed out in the *Hadeeth*, this exact number has been used to describe the time interval “thickness” or we can say the distance interval “thickness” of each sky and also to describe the time or distance interval between any two successive skies. This means that, the total years between any two consequent skies are 1000 years, and consequently there will be 6000 years to reach the 7th sky. The question is what kind of years we are dealing with? Is it earth years or we are dealing with totally different space-time frame? In my humble opinion, at the beginning of creation nothing was there except the *Creator* himself. So, the time frame we should deal with must be the time frame of the *Creator* and not our time frame. This can be anticipated from the *Quran* in three different verses, two of them mentioned that 1 day in the time frame of *Allah* equals exactly 1000 earth years (Relativity more than 1400 years)[1][2]. The third verse after translation to English language mentioned that “the Angels and the Holy Spirit ascend unto Him (*Allah*) in a Day the measure whereof is (as) *fifty thousand years*” [3]. The last verse is the one I am interested in for two reasons; it did mention *50,000* years and for the word “ascend”. It gives you the sensation of traveling through the space. In other words, if we can just replace the 500 years mentioned in the *Hadeeth* to be 500 years in the time frame of *Allah*, instead of literally taken them as earth years, and that each day in these years equals to 50,000 earth years. Applying this new conversion, we will have this equation to get the total number of earth year equivalent to the 500 years in *Allah*'s time frame. In the calculations, the earth year will be substituted by the lunar year (≈ 354 days):

$$\begin{aligned} 500 \text{ years (Creator's time frame)} &= 500 \times 354 \times 50000 \text{ earth years} \\ &= 8.85 \times 10^9 \text{ earth years} \approx 9.0 \times 10^9 \text{ earth years} \approx 9 \text{ billion years} \end{aligned}$$

Given that, we are the only species investigating and exploring the universe, and following the cosmological principle, which states that the universe is isotropic (has the same average features; mass density, expansion factor, and so on, in any direction) and homogeneous (has the same average features at any position) when large enough volumes of the universe are sampled. I am going to consider the planet Earth to be in the origin, and the whole universe as colossal concentric spheres (*Figure 1*), each sphere represents a sky or “universe”, in that case, these 9×10^9 earth years will represent the “*time thickness*” between the Earth and the 1st sky in all directions. Doubling this value we will get:

$$\begin{aligned} 1.8 \times 10^{10} \text{ earth years} \\ \approx 20 \text{ billion earth years} \end{aligned}$$

This value represents the total “*time thickness*” from the Earth to the upper boundary of the 1st sky and consequently the “*time thickness*” between any two successive skies. So, the diameter of the 1st sky (visible universe) will be ≈ 40 billion years, and due to the curvature nature of the universe [11]. this will make the maximum separation between any two opposite stars along the diameter equal to the length of an “arc” that will equal to half of the circumference of the universe, and that will be of the order of 6.23×10^{10} years (≈ 62 billion years) (*Figure 2*). In the *Hadeeth* there are 7 skies, in other words, the total “*time thickness*” for the whole 7 skies (universes) will be in the order of:

$$\begin{aligned} 1.8 \times 10^{10} \text{ earth years} \times 7 \text{ skies} &\approx 1.3 \times 10^{11} \text{ earth years} \\ &\approx 130 \text{ billion earth years} \end{aligned}$$

Universe Space Dimension

To calculate the “*distance thickness*” for the 1st sky, and consequently for the whole universe. We noticed that the Angels and the Holy Spirit had been stated in the *Quran* verse [3]. They are regarded to be created from light, so their speed can be considered to be the speed of light or even faster. Thus, light year will be considered to be used in the calculations. As we know, light year $\approx 9.5 \times 10^{12}$ km. One can straightforward calculate the “*distance thickness*” using the following relation:

$$\begin{aligned}
 1.8 \times 10^{10} \text{ earth years} \times 9.5 \times 10^{12} \text{ km} &\approx 1.7 \times 10^{23} \text{ km} \\
 &\approx 5.7 \times 10^{10} \text{ parsec} \\
 &\approx 1.1 \times 10^{15} \text{ AU}
 \end{aligned}$$

Where, 1 parsec $\approx 3 \times 10^{16}$ m, and 1 astronomical unit (AU) $\approx 1.5 \times 10^8$ km. This calculated distance is in a good agreement and can be well accepted, it is even greater than the recently measured distance between the Earth to the most remote known objects in the visible universe ($\approx 1.4 \times 10^{23}$ km /or ≈ 13 billion light years)[5][11]. Even, this measured distance we can't take it for grant and is not totally accurate due to imprecision and errors in the measuring devices such as Hubble Telescope (uncertainty of about 25% for the recently accepted value of Hubble's constant)[7][8][11]. These devices have errors in their measurements because most of them depend on measuring the intensity of EM radiation like; visible light, X-rays, or even Gamma rays. The intensity itself of these EM radiations is governed by the inverse square law and more over, suffers scattering, absorption and attenuation processes as EM radiations propagate through space. Now, we can conclude the total "distance thickness" for the 7 skies to be in the order of:

$$\begin{aligned}
 1.7 \times 10^{23} \text{ km} \times 7 &\approx 1.2 \times 10^{24} \text{ km} \\
 &\approx 4 \times 10^{11} \text{ parsec} \\
 &\approx 8 \times 10^{15} \text{ AU}
 \end{aligned}$$

Conclusion

The interested two values computed in this paper for the "time thickness" and "distance thickness" of the 1st sky which are ≈ 20 billion earth years and 1.7×10^{23} km respectively, will represent the boundaries of the "visible universe" as we know it, and can be widely accepted and consistent with most predicted theories[5][6][9][11]. The computed value for the "time thickness" is greater by almost 7 billion years than the recent measured value (≈ 13 billion years). The question now, is what about these 7 billion years? In my opinion, this question might have two different answers; the 1st one is; either the devices we are using now to explore the universe are not capable to measure the very faint light intensities coming from objects near to the edge of the universe. 2nd one; is that the size of the observable universe could thus be smaller than the entire universe and that the observable universe still need to expand to cover this 7 billion years gap to reach its boundaries limit. In either case, whether we can't "see" the limit boundaries or the observable universe still need time to reach it, the expansion of galaxies or star clusters will not exceed this boundaries. In my belief, once the observable universe reached its boundaries, the universe will start to shrink on itself and we will observe the "Blue Shift phenomena" rather than the "Red Shift

phenomena” marking the end of universe expansion and this will be ultimate fate of the universe.

At the end, I would like to state that, *Quran* is not a scientific book but if we want to extract scientific clues from it. That will depend on our understandings and interpretations which can be right or wrong. This research is purely personal assiduity from my side to interpret some verses of the *Quran* and *Hadeeth* in more scientific approach. Therefore, if the calculation I made is right, this means that I have been blessed by *Allah* Almighty, and if the calculation was wrong, this means that, my interpretation is incorrect and the mistake is from me and my soul.

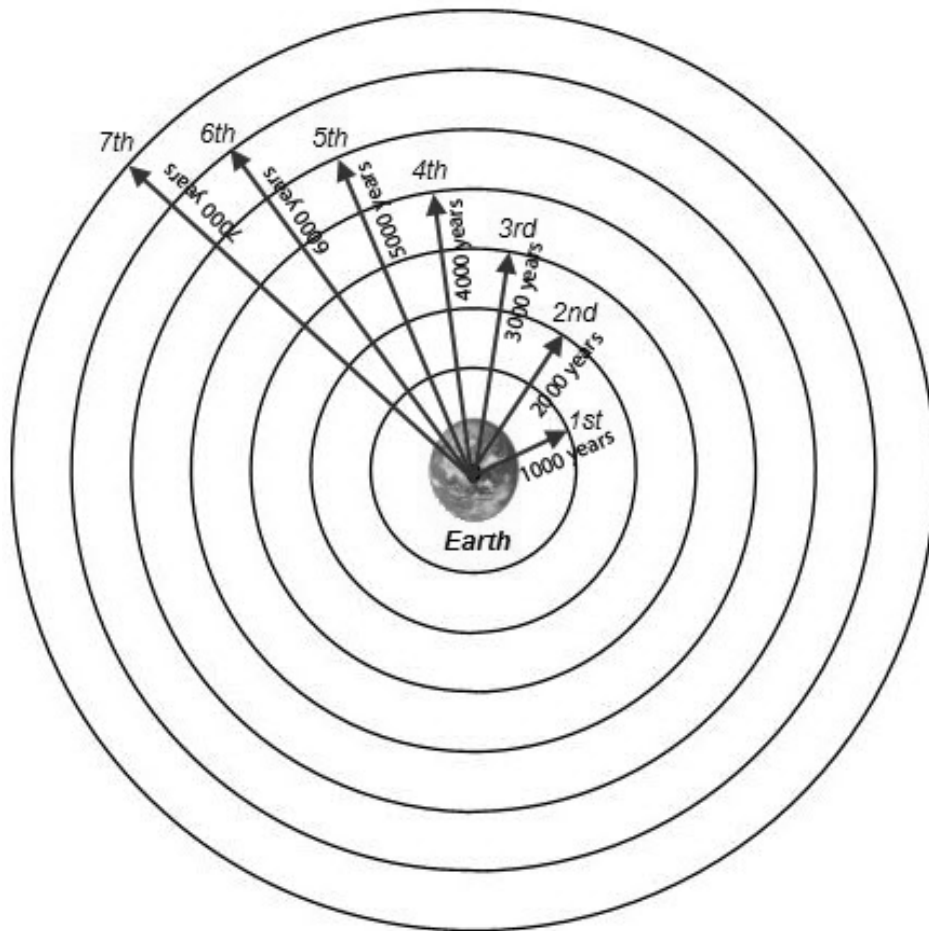


Figure 1: Schematic diagram shows the Earth at the origin and the 7th skies as colossal concentric spheres. The “time thickness” between any two successive skies is 1000 years (in Creator’s time frame).

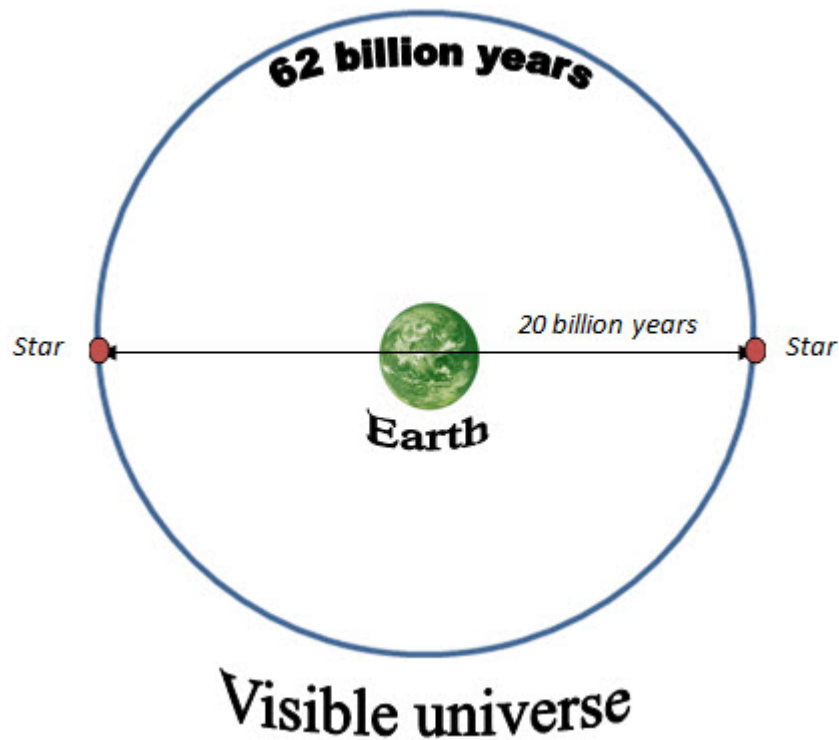


Figure 2: Schematic diagram shows the Earth at the origin and the 1st universe. Radius ≈ 20 billion earth years. Length of the arc between two opposite stars at the edge of the visible universe ≈ 62 billion earth years.

References

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