International Journal of Scientific Research and Modern Education (IJSRME)
Impact Factor: 7.137, ISSN (Online): 2455 – 5630
(www.rdmodernresearch.com) Volume 6, Issue 1, 2021

IS UNIVERSE EXPANSION CAUSED BY SPACE EXPANSION?

Xinghong Wang
Room 504, Gate 2, Building 44, University of Science and Technology,
Beijing, China

Cite This Article: Xinghong Wang, "Is Universe Expansion Caused by Space Expansion?", International Journal of Scientific Research and Modern Education, Volume 6, Issue 1, Page Number 1-3, 2021.

Copy Right: © IJSRME, 2020 (All Rights Reserved). This is an Open Access Article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract:

In explaining the accelerating expansion of the universe, the space expansion theory is the current theory used by most physicists. However, this theory is questionable in explaining why space expansion happens in some place but doesn't happen in some other place. It is also doubtful why space expansion happened sometimes but doesn't happen at other times even though the conditions are similar. In contrast, the radiation pressure force and cosmic rays force theory can be used to explain these 2 questions perfectly. This article also proposed a way to determine whether there is a space expansion or not.

Main Text:

It is a commonly-known fact that the distances between all of the remote galaxies are observed to be increasing. This is called the expansion of the universe. Because the separating galaxies are very far away from each other, the gravitational force between them is very weak, the expansion of the universe can also be expressed as: the increase in distance between any two given gravitationally unbound parts of the observable universe with time. And actually, the rate of expansion of the universe is increasing although there still exist certain gravitational forces, albeit very weak due to enormous distances, between remote galaxies.

The current theory used to explain the expansion of the universe is space expansion. That is, the reason for the current expansion of the universe is that the space itself is expanding although the galaxies are not moving away from each other. Because the space between galaxies are expanding, the distance between the galaxies is increasing although there is no force pushing the galaxies away from each other.

However, in my previous article named "A study on the forces that cause the universe's accelerating expansion", the radiation pressure force and cosmic rays are discovered as causes for the universe to expand. Specifically, the overall effect of the gravitational force and the radiation pressure force of a star will cause nearby matters to contract and cause faraway matters to expand, and cosmic rays cause matters to expand further. Now, more detailed and comprehensive calculations which includes all related factors may be needed before arriving at a more thorough conclusion. Nevertheless, the radiation pressure force and cosmic rays will either be the only reason to explain the accelerating expansion of the universe, or it will be one of the reasons.

At this point, the author wishes to question the validity of the current theory of space expansion in the following aspects.

Firstly, if the space itself expands, it should expand undifferentiated. It should never choose to expand in some place and not to expand in some other place. However, the current theory of space expansion says conveniently that the space where there are matters doesn't expand. For example, the earth, the sun, a banana in your hand, and the space around the entire Milky Way don't expand. The reason given by this space expansion theory is that there are gravitational force bounding the matters together, so there is no space expansion where there are matters and relatively stronger gravitational force. This explanation is fundamentally flawed because the space expansion is a change of the space and any change of space must have an effect on matters otherwise the definition of "the change of space" will become meaningless. Some might argue that space expansion does have effect on matters because faraway galaxies are separating away from each other. But this argument is powerless because any physical law, such as this that the space expands, must apply to the entire universe and cannot just apply to part of the universe it chooses at will. For example, according to the theory of relativity, the space around the sun is distorted by the gravity force of the sun, then this distortion of the space will overwhelmingly affect the movement of Mercury and any other object within range and therefore change their orbits. No, the physics doesn't have a will. It has to be universal. If the space between 2 faraway galaxies has doubled during the past 10 billion years, the space between 2 quarks should have also doubled during the same period of time. If this doesn't happen, then what is happening is not a space expansion but a force pushing things apart. If there is actually a force moving things away, the space between 2 quarks will reasonably not double because the force that bounds the 2 quarks together is so strong that it easily overcame this force that pushes things apart.

Also, if we suppose that space expansion theory is correct and matter will automatically stop space inside it and near it from expanding, a question can be asked: for an atom floating in the vast space between 2 remote galaxies that are expanding away from each other, how much space will this atom govern and stop from expansion? One meter long or one km long? Then, will the space expansion between these 2 galaxies stop when

we put sufficient numbers of atoms at a certain interval? This means, we can easily tie any 2 huge and remote galaxies together by just a long line of atoms? Or, we can replace the line of atoms with an extremely long hair. For a 1-meter-long hair, its weight is 10^-3 gram. Then a 10-billion-light-years-long hair will weigh9.46x10^19kg, which is only less than one ten thousandth of the weight of the earth. So can you believe it that so little mass can stop the galaxies 10 billion light years away from expanding away from each other if we connect the 2 galaxies with this hair? Remember here that it is not the extremely weak gravity pull of the hair which stop the galaxies from expanding but the existence of hair which is matter because matter automatically stop the space from expanding according to the theory of space expansion. Therefore, the theory of space expansion seems very doubtful.

Furthermore, if the space does expand, it should also expand undifferentiated in terms of time. It should never choose to expand in some time and not expand in some other time if the situations are the same or very similar. Because at a very early age of the universe, it is extremely hot and dense. Compared with the sun which is now also very hot and dense, the gravitational force of that time is much stronger than the sun, but the space still expand overwhelmingly at that time. The gravitational force of all matters including quarks and neutrons didn't prevent the space from being expanded. Well, now, in the solar system or inside the sun when the gravitational force is much weaker, the space expansion is easily stopped by the weak gravitational force. Seems very illogical.

In contrast, the theory of radiation pressure force discussed in my previous article can easily explain this. Because in early age of the universe, when it is very hot and dense, much energy may take the form of light and this strong light can be a huge force to expand the universe at a extremely fast rate in the early life of the universe even though the gravitational force is very strong. Let's look at the typical picture, shown by figure 1, showing the expansion of the universe, we can easily find a positive correlation between the universe expansion and the brightness of the universe. Thus the radiation pressure force being the cause of the expansion of the universe seems perfectly logical.

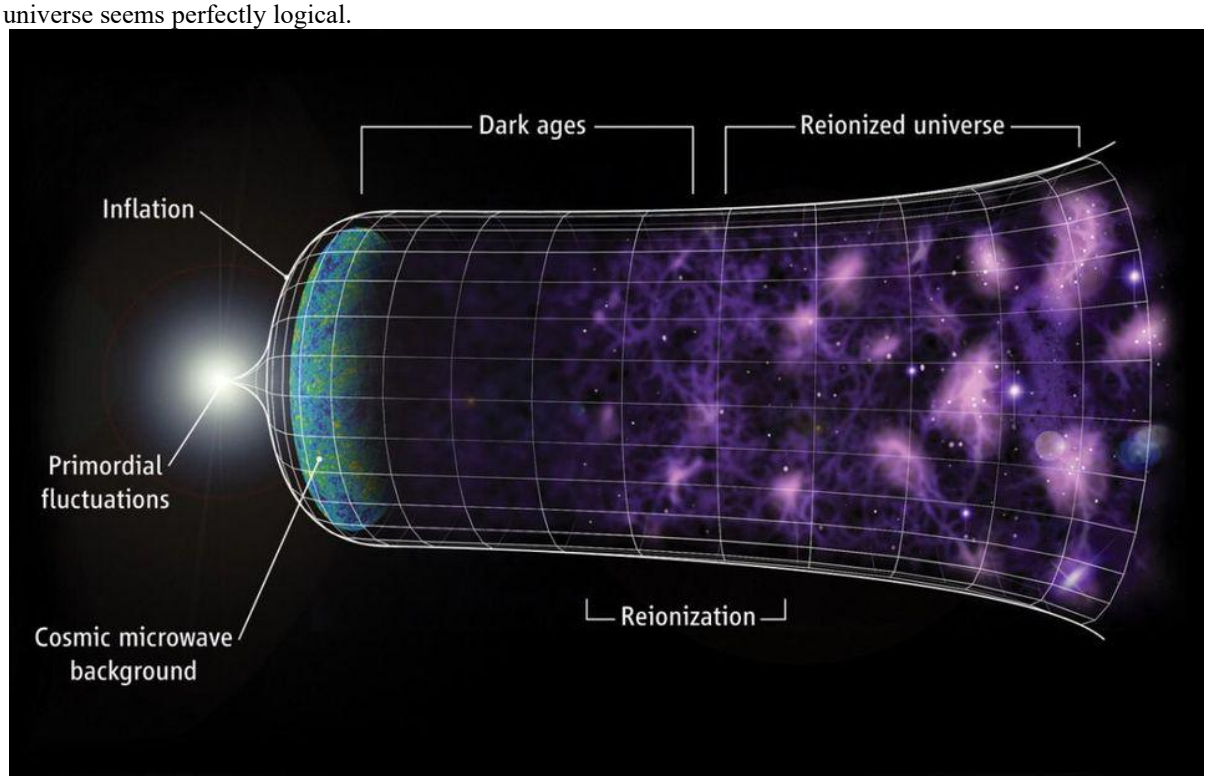

Figure 1

Now, we can reach at a conclusion that, in explaining universe expansion, radiation pressure force, plus cosmic rays, is a better one than the space expansion theory if we have to choose only one explanation. As mentioned earlier, it is possible that several causes function together and result in the expansion of the universe.
Actually there is a scientific way to inarguable determine whether there is a space expansion or not during the process of universe expansion. That is, if we can know the actual distance of a remote star, we will be able to determine whether the space is expanding or not. Suppose, for now, there is a remote star which is A light years away from us, and its light has traveled B years to reach us, and B years ago the remote star is C light years away from us. Then, we don't need to know A. If B=C, there is no space expansion. If B>C, there is space expansion. For example, if we already know that a remote star is born 1 billion years ago at a distance of 1 billion light years away from us , and we can receive its light now, this means there is no space expansion between this star and us although this star can be rapidly moving away from us. Then the moving away is not

caused by space expansion but by a force. However, if the light of this star has not reached us now but will reach us maybe many many millions of years later, we will know that there is space expansion between us and this star.

Conclusion:

- The space expansion theory is questionable because the space expands in some place but doesn't expand in some other place inside universe.
- The radiation pressure force, plus cosmic rays, can be used to explain why the universe expands in some place and doesn't expand in some other place.
- The space expansion theory is doubtful because, in some place, the space expanded before but doesn't expand now even though the actual conditions are similar.
- The radiation pressure force, plus cosmic rays, can be used to explain why the universe expanded before in some place but doesn't expand now even though the actual conditions are similar.
- If we can know the actual distance of a remote star from us, we can decisively determine whether there is a space expansion or not.

References:

1. Zeeya Merali. "Cosmic expansion is not to blame for expanding waistlines." new scientist, 2005, https://www.newscientist.com/article/mg18825194-800-cosmic-expansion-is-not-to-blame-for-expanding-waistlines/
2. Ethan Siegel. "This Is Why We Aren't Expanding, Even If The Universe Is." Forbes, Feb 19, 2019,https://www.forbes.com/sites/startswithabang/2019/02/19/this-is-why-we-arent-expanding-even-if-the-universe-is/?sh=38bd2dc45311
3. Lady Igor. "Hair weight and headaches." Igors bell tower, 2011, http://igorsbelltower.blogspot.com/2011/09/hair-weight-and-headaches.html
4. Overbye, Dennis (11 October 2003). "A 'Cosmic Jerk' that reversed the universe". The New York Times.
5. Lemaître, Georges (1927). "Un Univers homogène de masse constante et de rayon croissant rendant compte de la vitesse radiale des nébuleuses extra-galactiques" [A homogeneous universe of constant mass and increasing radius accounting for the radial speed of extra-galactic nebulae]. Annales de la Société Scientifique de Bruxelles. A47: 49–59.