The cause and development of cosmic background radiation

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Objective

The objective of this paper is the examination of possible causes and developments of cosmic background radiation. In this context, two different cosmic models are evaluated and the results are compared.

1. The cause and development of background radiation in the expanding cosmos (big bang theory)
2. The cause and development of background radiation in the constant cosmos (not an ideal sphere)

The following arguments are based on the fundamental fact that in every space geometrical model with cosmic dimension time has to be taken into consideration. In addition, background radiation consists of light quants that appear to be extended in their length. All light quants move through space at the speed of light. They do not remain stationary anywhere in the universe. An observer cannot look into space and see a distant past. On the contrary, the light from a distant location and time reaches the observer.

1. The cause and development of background radiation in the expanding cosmos (big bang theory)

It is commonly accepted that cosmic background radiation is left-over radiation from the birth of our universe. Everything started with the Big Bang. In the beginning, pure energy existed at an incredibly high temperature. Space, filled with this energy, began to expand at a speed greater than the speed of light. The first building blocks of atoms and soon after atoms developed with the continuing expansion and cooling down of the space. Once the young cosmos had cooled down to 3000º Kelvin, it became transparent. This made it possible for light to move through space freely for the first time. The light and energy ionized existing atoms, which in turn reflected the light. This reflected radiation is the cosmic background radiation still visible today. The radiation began its journey at a temperature of 3000º Kelvin, but with the further expansion of space and light quants, it has cooled down to 2.7 º Kelvin, and is detectable only as micro wave radiation.

The micro waves reach us on Earth with a surprisingly constant temperature from all angles of the universe. Their temperature varies by 0.000001º. Research predicted the micro wave radiation, and after several years of intense searching, it was finally discovered. Ever since, micro wave background radiation and galactic red shift of light are the strongest arguments for the big bang theory.

Visibility of background radiation over time

Two points in the universe shall be analyzed to determine the visibility of background radiation over time. One of the points is close to the edge of the universe, and the other point is in the center of the universe. As the source of background radiation the ionized atoms of the young universe are no longer available, which limits the lifetime of background radiation. Eventually, the radiation leaves the universe at the speed of light. It is important to distinguish between true background radiation and the light quants that are constantly emitted by objects, for example, stars.

When examining the characteristics of background radiation in the expanding cosmos, two parallel movements are considered: the expansion of space and the movement of light quants. For example:

Imagine a bus made of an elastic material. The rear is firmly secured to the ground, while the front is free to move. Once the front begins to accelerate, the whole bus stretches. Suddenly, the driver realizes that he has forgotten his lunch in the rear of the bus, turns on the auto pilot, and walks to the back of the bus to retrieve his food before lunchtime. However, the front of the bus moves faster than the bus driver can walk. Will the driver ever be able to retrieve his lunch? If yes, when?

To answer these questions, it is necessary to calculate with concrete speed ratios. Therefore, the front of the bus shall move three times as fast as the driver, and both shall move at a constant speed. *Figure 1* illustrates the path of the bus driver from the view of an inertial observer. At first, the bus driver seems to move backward because the bus drives faster than he walks, but over time, the different speeds annul each other and the bus driver begins to move toward the end of the bus and gets faster with every step. Eventually, he arrives in the back of the bus and gets to eat his lunch.

This example can be used to clarify the movement of light quants within the ever expanding universe. The bus represents the expanding cosmos, with the rear being the stationary center and the front being the fast expanding edge of the universe. The bus driver represents the light quants of the cosmic background radiation.

→ *A point close to the edge of the universe*

Let us look at a point that lies close to the edge of the universe. At the beginning, in the 3000^{o}K hot universe, the background radiation is equally visible from all sides. However, soon after, the last light quant of background radiation coming from the close edge of the cosmos passes the point on the journey to the center of the universe. Hence, one side of the point does not have any background radiation anymore. Over time, the hole in the radiation grows, until after about 25 billion years, no background radiation is detectable.

→ *A point in the center of the universe*

For a point in the center of the universe, background radiation approaches equally from all sides. An observer in the center will see a constant flux of radiation, which abruptly disappears, once all the light quants have passed the center and move toward the opposite edge of the cosmos. From this moment on, the background radiation will never be seen again from the center. This also means that the more light quants move toward the opposite side of the universe, the bigger is the space without background radiation. Eventually, the universe is free of micro wave radiation that has been the result of the big bang.

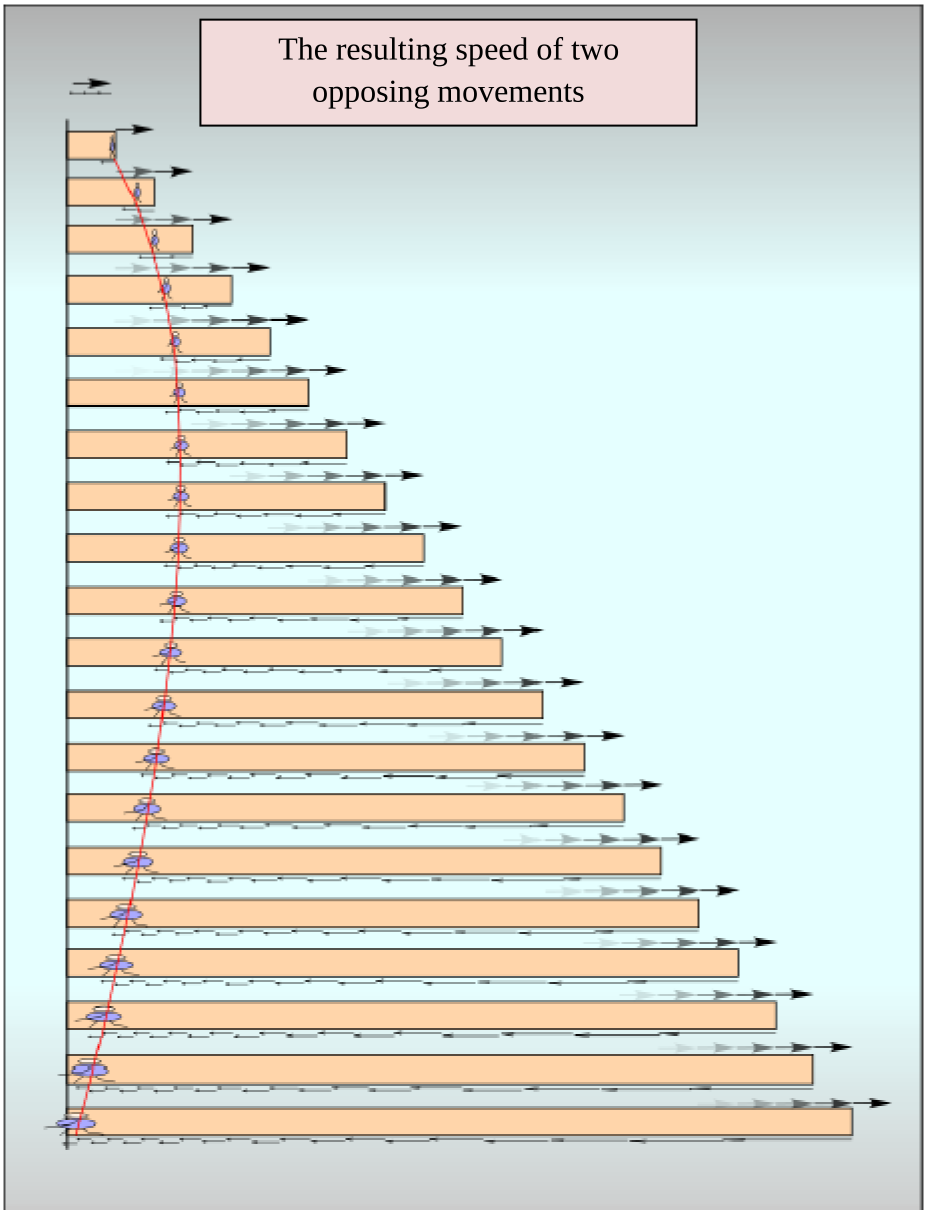

Figure 1:

The driver is walking to the rear of his ever expanding bus. The large arrows represent the constant speed of the front of the bus, while the smaller arrows under the person demonstrate the direction of movement of the driver. The driver moves at a constant speed, which is one third of the bus'.

If this model is modified to approach the real life conditions of the universe, the speed of the front of the bus has to decrease. As F*igure 2* shows, the driver's speed increases as he reaches the rear of the bus. Therefore, depending on the conditions of the universe at the beginning of time, the background radiation cannot be seen at the center of the cosmos anymore after 10-11 billion years. The space free of background radiation steadily increases, until the whole universe is free of radiation after 20-23 billion years.

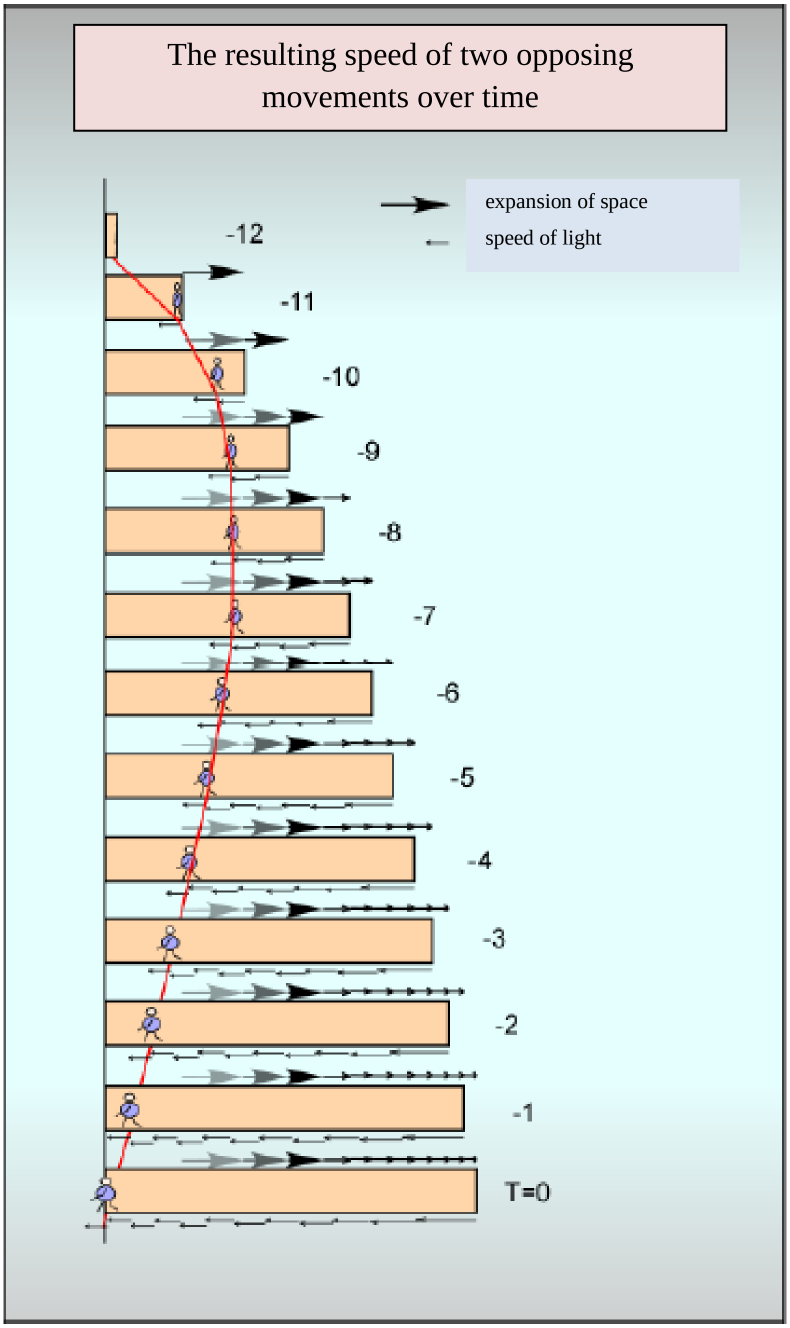

Figure 2:

The values from Figure 1 are slightly modified. The front of the bus moves three times faster at the beginning of the journey. The smaller arrows starting at the third time frame demonstrate that the speed of the front of the bus decreases continually. The driver, however, still moves at the same speed. Hence, the driver in Figure 2 reaches the rear of the bus much faster than the driver in Figure 1. The red curve therefore represents the true movement of light quants through space.

Looking at outer space from Earth, it is possible to make the following statements: If one assumes a big bang -

- …the Milky Way is not at the edge of the universe, because background radiation is visible all around us.
- …the Milky Way is close to the center of the universe. With every year that background radiation is visible from all sides, the Milky Way must be closer the universe, if not directly in the center.
- …once all light quants have reached the center of the universe, the background radiation visible from Earth would disappear.
- …the early years of the universe are not visible to us, not even up to the point that the universe turned transparent. This means, the first 500,000 years of the universe are and always will be invisible because the first light quants of that time have not reached us yet. Otherwise, the background radiation would have disappeared already. In addition, the universe was not transparent yet.
- …the background radiation everywhere in the universe would have already disappeared

The reason for this can be seen in *Figure 1*. Space in this figure has a three times faster expansion rate than the background radiation (driver walking toward the rear). Illustrated are 20 expansion frames, each of which is three times as long as the opposing background radiation. Hence, the background radiation needs three periods to cross one space-time-period, which amounts to 60 periods. However, F*igure 1* only displays 20 partial distances (small arrows at the bottom of the figure). Consequently, a time-distance ratio cannot be found here. If these new realizations are applied to the real universe, the big bang theory is impossible. Even though the edge of the universe is 13.7 billion light years away from us, a light quant from the edge does not need as much time to reach us. (The edge was much closer to us at the time the light quant started its journey). With the current measured size of the universe and an assumed age of 10-11 billion years, the background radiation would not be visible in the center of the universe anymore.

2. The cause and development of background radiation in the constant cosmos (not an ideal sphere)

The background radiation in a constant cosmos is emitted by the galaxies or masses that orbit almost at the speed of light at the edge of the universe. This means that the galaxies or masses continually emit light, which travels through space and is visible as micro wave radiation from planet Earth. In the future, more advanced satellites ought to focus in on the radiation and show small light dots and eventually whole galaxies. In addition, background radiation cannot leave a constant cosmos because of the increasing bend in space toward the edge.

The presence of background radiation is a definitive proof against the big bang theory.

Unless, the Milky Way happens to be exactly in the center of the universe and the light quants of the early universe have not crossed space yet (which is a highly unlikely scenario), background radiation is the result of galaxies that orbit in the current edge of the universe and continuously emit light. To further support the theory of the constant cosmos, a slight variation of Gentry's model of the universe ought to be evaluated.