The angle expansion of galaxies in the universe

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Objective

The objective of this essay is the examination of angle expansion of galaxies in the universe. For this purpose, two different models of cosmic time are evaluated and compared to actual measurements:

1. The development of angle expansion of galaxies and the big bang theory
2. The development of angle expansion of galaxies in the constant cosmos

Facts about the angle expansion of an object moving away from the observer

Every object with a spatial expansion is seen at a specific angle – the radian measure or angle expansion - from a certain distance. This expansion changes with distance. If the size of an object is known, it is possible to determine its distance from the observer by using its angle expansion. The relation between angle expansion and distance is simple. An object with an angle of 10º at a specific distance, for example, is seen at half of this angle if the distance is doubled. Hence, the value of angle expansion is reverse proportional to the distance.

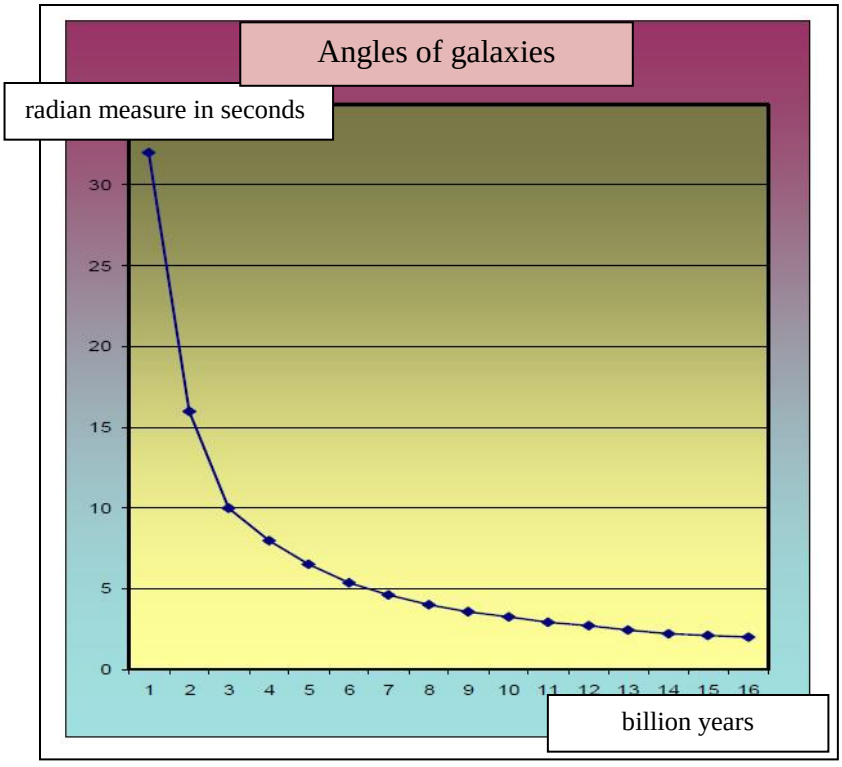


Figure 1
The size of galactic angle expansion changes with distance. The angle expansion decreases with increasing distance, and at a distance of 16 billion light years reaches a value of only two radian seconds. The horizontal axis shows the distance of a galaxy in billion light years, which is a distance that extends over the edge of the current universe.

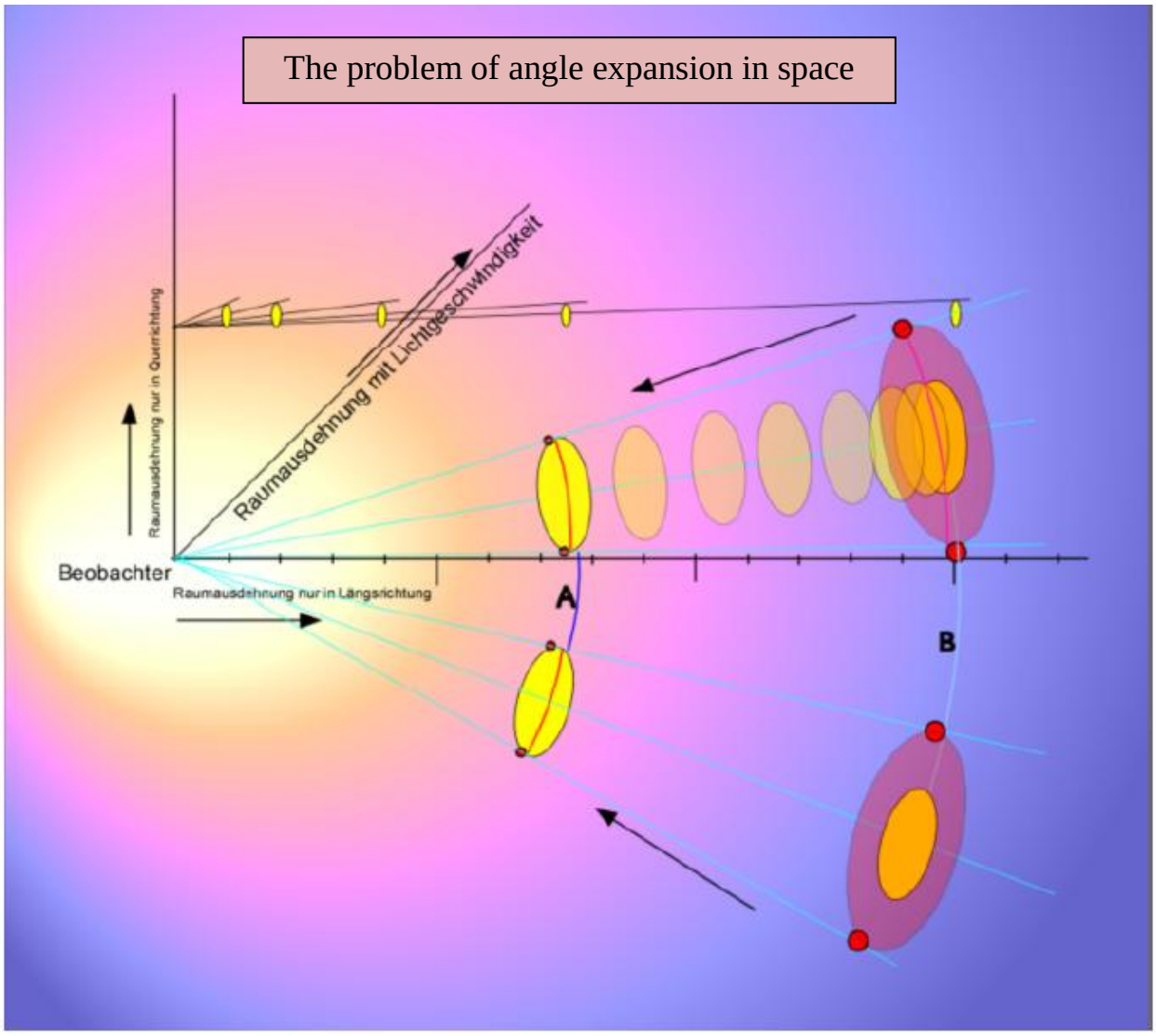
For an average galaxy, for example, the Andromeda Galaxy with a diameter of 200,000 light years and a distance from Earth

of 1.5 million light years that appears under an angle of 4.5 º, an according figure, such as F*igure 1*, provides the angle expansion for every possible distance.

1. The development of angle expansion of galaxies and the big bang theory

The influence of an expanding cosmos on the angle expansion of its galaxies over time is to be examined. It is substantial to understand that we do not look into space, but that rays of light reach us from the depths of the universe. Hence, we cannot look into the depths of space and therefore, see the past.

According to the big bang theory, the universe is ever expanding. Hence, when going back in time, it would shrink. When the first galaxies developed, the universe was only a tenth of its current size.



The changes in angle expansion of a galaxy over time according to the big bang theory

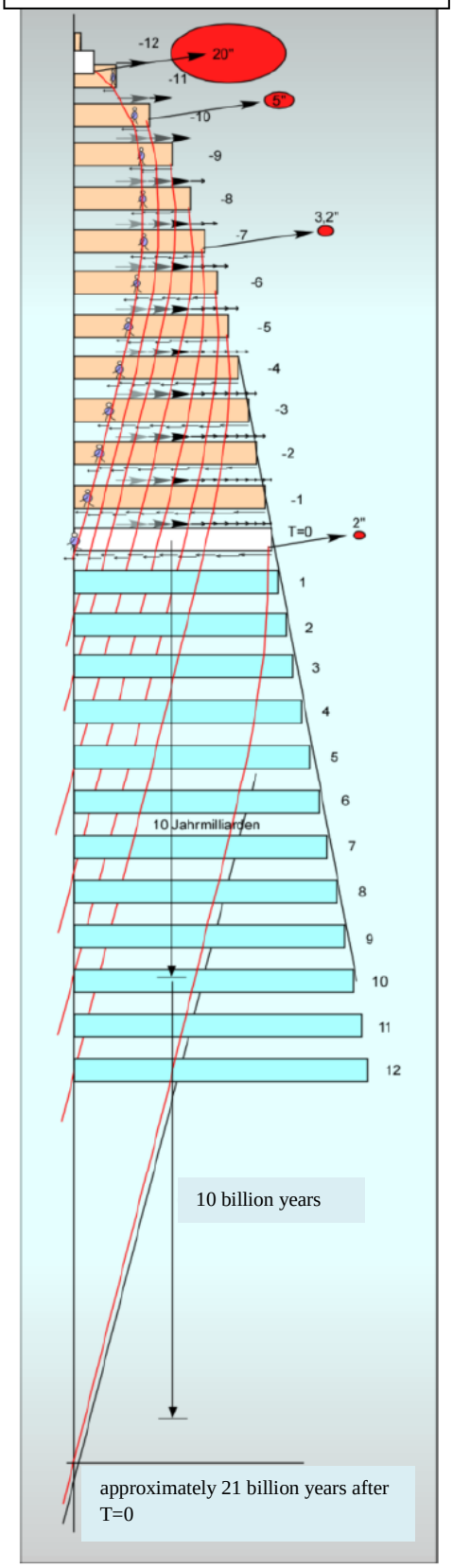


Figure 2

For the big bang model, the exact moment of light emission is responsible for the angle expansion of a galaxy (here illustrated as yellow ovals). The red dots symbolize the light quants during moment A (when they are sent out). During moment B, the light quants stretch together with space but retain their orientation within the universe over time. The problem of angles in space is that light quants sent out by a galaxy participate in the expansion of space. Consequently, the angle of a galaxy always remains the same. The galaxy itself does not expand; therefore, the moment light is sent out is responsible for the angle expansion visible from Earth. An "early" galaxy always appears under a big angle.

During the expansion of the universe, the galaxies themselves have remained the same size, as they are gravitationally stable. This means, they do not participate in the expansion of space. Hence, only the space in between galaxies increases or they seem to move away from each other. In the past, the galaxies must have been closer together (Compare the distance of galaxies during moment A and B in *Figure 2*).

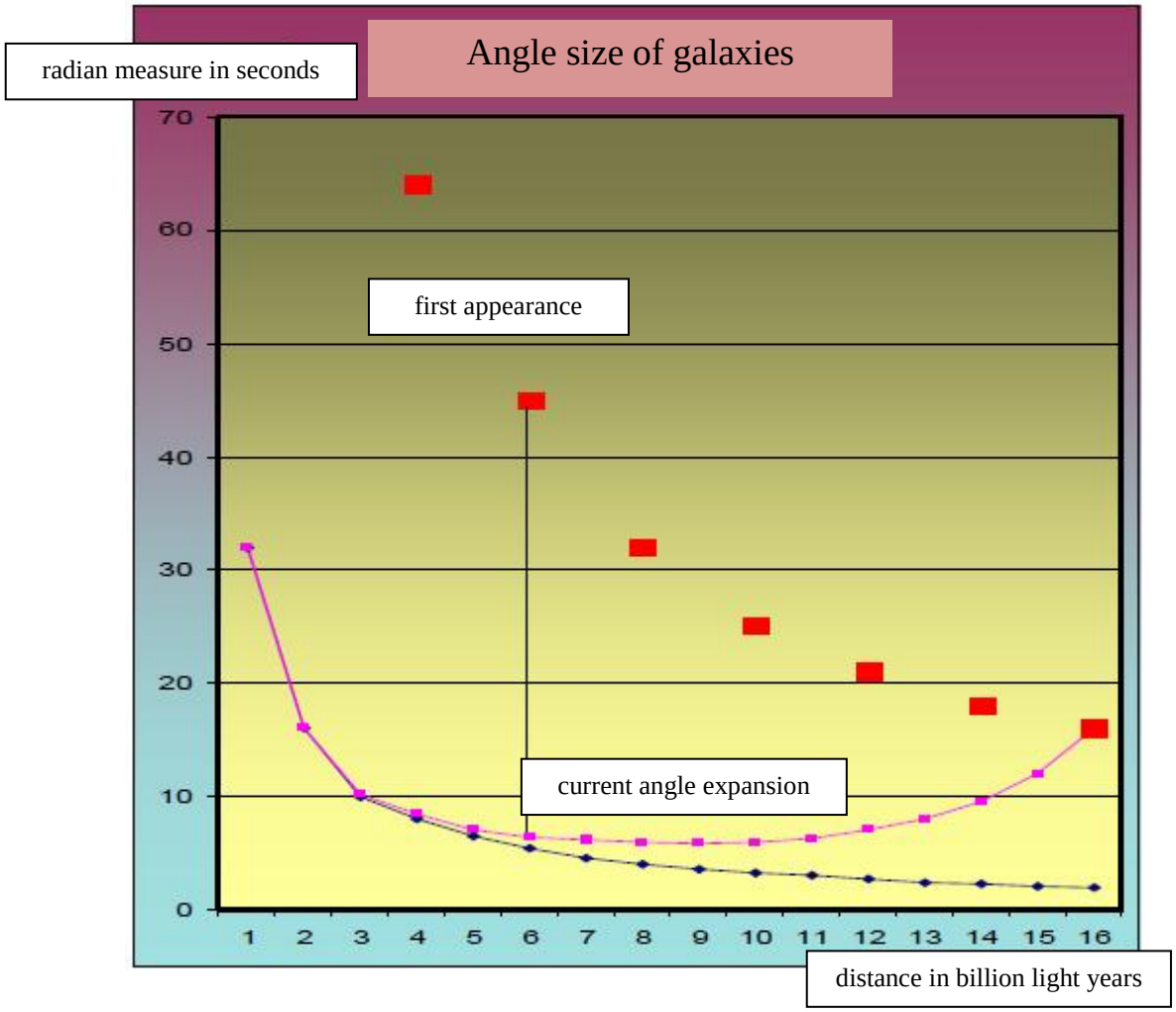
Figure 3

The red lines represent the movement of light quants sent out by a galaxy close to the edge of the universe at different times in the past. The galaxy becomes visible in the center of the universe in which the curved red lines cross the vertical line. The horizontal rectangles illustrate the expanding space between the center (left) and the edge (right) of the cosmos. Time passes from the top to the bottom with T=0 being the present time.

A galaxy at the edge of a 10 times smaller universe would have the angle expansion of 20º. However, the problem is that this galaxy would only be visible to an inertial observer, who is independent from time and location. The light that was sent out from the galaxy cannot reach the center of the universe because it was *pulled out* by

the high rate of space expansion in the early cosmos (Compare to *the reason and development of background radiation*).

It is important to differentiate between the light and the matter sent out by a galaxy. The matter of a galaxy is gravitationally bound, and prevents the expansion of the galaxy in space. The size of a galaxy remains constant over time, even though the universe around it expands. The light, however, stretches with the cosmic expansion. Because this expansion occurs in every direction (horizontally, vertically, etc.), the light retains its original angle over time. An observer in the center of the universe will see an angle expansion equal to that of the time the light was sent out by the galaxy. Consequently, after 10 billion years the light from the early times of the galaxy reaches an observer in the center of the universe at a distance of 1.5 billion light years with an unchanged angle of 20 seconds (*Figure 3).* The light sent out a billion years later has the angle expansion of close to 10 seconds, etc. If this pattern is repeated, for every one billion years, as seen in *Figure 3*, the angle expansion of the observed galaxy shrinks.



Once an angle of the currently measured two radian seconds is achieved, it becomes clear that the assumed time frames do not match. A galaxy in F*igure 3* requires about 20 billion years to be

seen with an angle expansion of two seconds. However, according to the big bang theory, our universe is only 10 billion years, which would require galaxies close to the edge of the universe to be seen at an angle of 20 radian seconds. In addition, the red shift of galaxies does not match the calculated angle expansion of galaxies close to the edge of an ever expanding universe (Compare to *the cause of the galactic linear red shift*).

Figure 4 *(page 4)*
The red rectangles mark the first appearance of a galaxy, visible from the center of the universe. At first, a close galaxy appears (upper left corner), next one at a distance from the center, and finally, after 10 billion years, a galaxy close to the edge with an expansion of 16-20 radian seconds (last red rectangle on the right). The pink curve represents the current angle expansion of galaxies over the distance according to the big bang theory, and the black curve illustrates the measured angle expansion of galaxies.
If the red and black curves continue toward the future, they eventually line up.

2. The development of angle expansion of galaxies in the constant cosmos

The angle expansions of galaxies close to the edge of a constant universe are equal to those measured in reality. Because space does not expand, the angle expansion of galaxies close to the edge does not change. However, galaxies inside the universe slowly move toward the edge and are seen with a red shift that matches their angle expansion.

→ The angle expansion of galaxies is easily explained in a constant cosmos.
→ The measured angle expansion of galaxies close to the edge of the universe is 10 times too small to validate a big bang theory. In addition, the observation of red shift combined with background radiation renders the big bang theory useless.
→ The currently visible light quants sent out by galaxies close to the edge of the universe, which lies at a current distance of 13.7 billion light years from the center of the universe, are proof for a constant cosmos.

These facts dismantle the big bang theory: The current background radiation combined with the red shift of galaxies at the edge of the universe (at a distance of 13.7 billion light years).

Questions about the consequences of this paper's discoveries

1. How many years after the big bang does a background radiation light quant that originates from the edge of the universe reach the center of the universe?
2. What is the angle expansion of an early galaxy (similar to the Milky Way) if it developed 300-500 million years after the big bang at the edge of the universe?
    a. When does the light of this galaxy reach us for the first time?
    b. After how many years is the angle expansion of this galaxy two radian seconds?
    c. How old was the galaxy at the time it sent out the light quants that reach us?
3. What are the average distances of early galaxies in the universe 300-500 million years after the big bang? What are the average distances of the galaxies in A1689?

... and their answers

1. Depending on the speed of space expansion, the light of the big bang disappears out of the universe after 7-11 billion years.
2. Approximately 20 radian seconds
    a. About 10 billion years after the big bang
    b. After 21-27 billion years
    c. About 10 billion years
3. Double the galaxy diameter in both cases