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Optical Deceptions in the Universe

The false estimation of the escape velocities of remote galaxies and the accelerated expansion of the universe.

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Imagine you are a passenger during the explosion of a New Year's rocket and observe the expanding particles. During your flight you will notice that all particles move away from you and the distant particles apparently fly faster than those nearby. Edwin Hubble discovered these phenomena with remote galaxies and concluded: the universe expands at an accelerated rate. This was erroneous. Since we are not able to discern our own escape velocity, we see all other objects moving away. The universe is not expanding at an accelerated rate. This article solves the mystery and describes the phases of expansion from the perspective of a participating observer, and shows how many mysteries of the universe can easily be solved.

We are a moving component in the expansion of the universe.

Incomprehensible phenomena

In 1929, Edwin Hubble showed – with the help of spectral analysis in the light spectrum of remote galaxies – a greater shift in the red range (Red Shift)[1], the more distant they were, and thus corroborated Lemaitre[2] and Alexander Friedmann's[3] theories about the expansion of the universe.
While doing so, Hubble pointed out two incomprehensible phenomena:

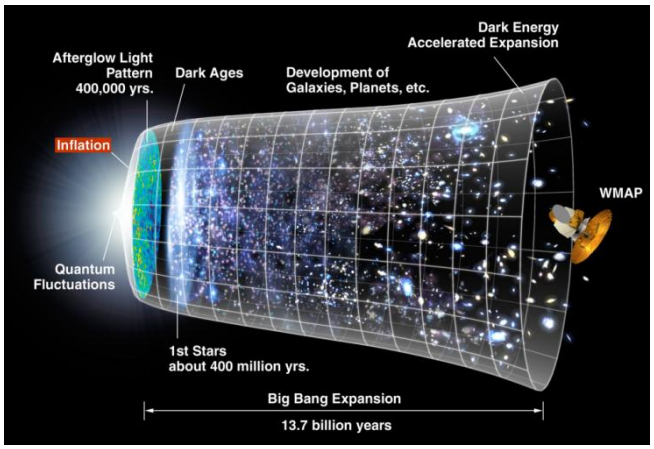
- All distant objects move away from us.
- The further an object away from us, the more rapid its escape velocity is.

Both phenomena are a mystery to this very day, and cannot be satisfactorily explained in physical terms yet, they are obviously measurable. It seems to us, we occupy a special place in the universe.
"Above all, it could seem as if we found ourselves in the center of the universe, since observation shows us that all galaxies move away from us" (Stephen Hawking[4])

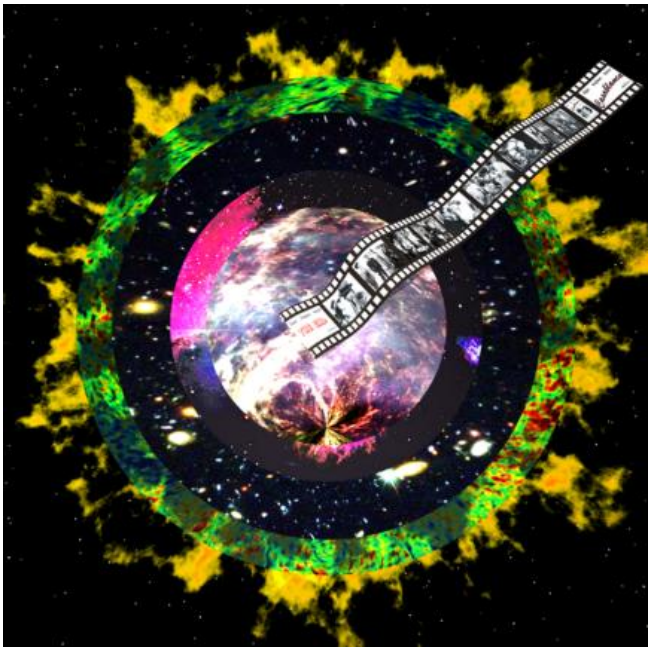
Online supporting material:
Becker-Fig-03.tif, Becker-Mov-01.avi

Since the most remote galaxies also have the greatest escape velocity, one concludes that the universe expanded extremely rapidly in the starting phase[5]. The inflationary space-time model depicts how the universe expands in the early starting phase, whereas galaxies from the immediate vicinity show that this expansion proceeds slower meanwhile.
Depending on the effects with regard to Dark Matter, the final phases of expansion proceed slowly or rapidly, perhaps even collapse again.
The inflationary expansion of the universe poses questions as to how such an extreme acceleration could have come about in the beginning. What is the energy that propels the universe in the accelerated expansion?
According to the present-day state of knowledge, the answer lies in the Dark Matter and in the Dark Energy[6].
This answer is even more mysterious: there is neither evidence nor are there measuring instruments for the existence of this transparent Dark Matter.
What cannot be explained is adapted through corrective values in the mathematical formulas, such as Einstein's cosmological constant Lambda[7] and the Hubble figure H[8].
It is assumed that light waves also extend in the expansion of the universe, and can thus explain a "hyperdrive velocity": accordingly, objects on the observation horizon move away from us at 3 times the velocity of light. However, this ostensibly does not contradict the theory of relativity, since the expansion of the universe is not motion in space, but rather an expansion of space.
Mathematical formulas and laws of physics are adjusted to match the measurement results. But is that the correct method? What do formulas help, that are annulled again with unknown factors? Why are the laws of physics bent?
Of course, the measurement results become increasingly finer, yet science enters the scene and does not come any further. The mysteries remain. Then should not the question have to be allowed as to whether the conceptual model is erroneous?
"You can never solve a problem on the same level on which it was created" (Albert Einstein)
This article offers a solution. At the same time, physics do not have to be altered in order to explain the inexplicable phenomena, but rather the approach. The upshot: the universe is not expanding at an accelerated rate, but we are rapid component of this motion and do not realize it!

Online supporting material:
Becker-Fig-05.tif, Becker-Mov-02.avi



The inflationary timeline (NASA)
http://map.gsfc.nasa.gov/m_ig/060915/CMB_Timeline300.jpg
Online supporting material: Becker-Fig-04.tif1



Online supporting material: Becker-Fig-07.tif.
Do we view a cinema film backward?

In the Big Bang standard model[9], it is assumed that at the age of the universe of 13.73 billion years the observable Cosmic Microwave Background (CMB)[10] was only 400,000 years old. But how can the CMB already have a radius of 13.3 billion light years if it may only be a maximum of 400,000 light years large at the time of its observance with an expansion at the velocity of light? How does this tally?

Online supporting material:
Becker-Fig-06.tif

The core of an explosion is small, so the image of the core can also only be small: 400,000 light years corresponds to the 6.6-fold radius of our Milky Way — one could almost touch it! Why is this image not left in its place? It does not belong placed on the edge of the universe. This notion is erroneous and makes it clear that there is a major mistake here.

One looks inside to the sheath of an explosion and thinks to be able to catch sight of the core out at *the* edge of universe, as if one would view a cinema film backwards with a mere glance at the universe. The further one looks, the further one sees the beginning of the film. But this is a contradiction.

Three perspectives are incompatible, and are not correctly taken into consideration in the standard model:

- The outward view into the "nursery" of the universe
- The consideration of the expansion of the universe after the Big Bang, from a small core to a broad sheath
- The consideration of the time which the mirror image requires in order to get back to us from the edge of universe.

How large and how old is the universe now if the reflection of the CMB (13.3 billion light years away) is just reaching us at the moment**?** Is it actually 46.5 billion light years old? How old is the CMB at the time of its observation if its sheath has a radius of 13.3 billion light years? Should the answer not be 13.3 billion years?[11] If one intends to correctly bring together the relationships, this does not function with the standard conceptual model!

A chronological sequence of the history of the universe can be depicted with the space-time diagram, but it entices us to believe we can look into the earliest phase of the universe if only we look far enough.

These incomprehensible phenomena – which are not solved to this day – emerge precisely because of this, and the phenomena will not be able to be solved unless the spatial understanding of our observation site changes.

In order to solve the problems, the existing conceptual models must be re-scrutinized, even if they are in the meantime a fixed component of the principles of science.

Online supporting material:
Becker-Fig-08.tif

The solution lies in the location of the observation

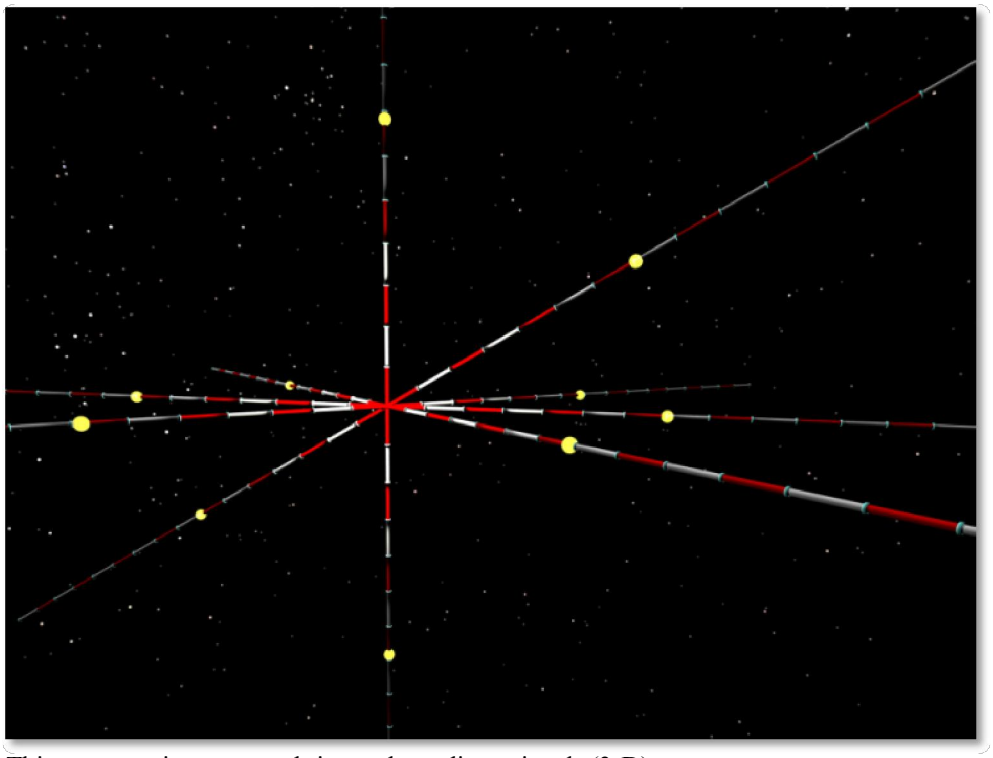
The following consideration is based on a uniform, linear expansion of an explosion.

The conceptual models are reduced to the simplest basis with regard to the physics, and so this consideration assumes that the expansion of the universe is a movement in space, and not an expansion of space.

First of all, this is a poor starting position for the explanation of the phenomenon of accelerated expansion, and yet the solution lies precisely therein.

This can only be understood when one places oneself as an observer on the Earth into a three-dimensional, expanding model, in which one is a rapid component of this expansion. On his voyage he then experiences exactly the same phenomena as Hubble described them — namely how all distant objects seem to move away from the observer at an accelerated rate.

Online supporting material: Becker-Fig-09.tif, Becker-Mov-03.avi
Reference objects moving on a scale with different views



This voyage is generated in a three-dimensional (3-D) computer simulation. A scale makes this amazing effect comprehensible.
If one takes the fastest possible expansion of the universe as a gauge for time and space, this is the expansion of light. It spreads out in a linear manner from the center, and as a remote part of the system it forms an ideal spherical shape, which can be depicted with a space-time scale.
The CMB is such a spherical expansion of light.
All other forms of expansion – such as gases, sediment and solid matter – follow specific laws and velocities within the expansion horizon of light.
The center of the expansion is the position – still unknown to us – of the center of the Big Bang.

Online supporting material:
Becker-Fig-10.tif, Becker-Mov-04.avi

In the subsequently described 3-D model, the expansion of the universe is depicted from the Earth's standpoint, and it already shows the phenomenon of accelerated expansion.
A scale with axes in the division of -15 to +15 (always in direction X, Y and Z), and additionally an axis at a 45° angle, mark the space. A reference object proceeds – always in the particular direction of an axis – at uniform velocity and in the direction of 0 to 15 on the scale. Two static camera angles and a camera movement are selected for the geometric representation, and this is rendered without and with a scale in each case. This results in 6 different animations for 3 camera locations.

Online supporting material:
Becker-Fig-11.tif, Becker-Mov-05.avi

First stage: the observation of the outward expansion
The first simulation is a matter of showing the principle of linear expansion in space.
If one initially considers the model of the expanding universe from above and beyond the system, a uniform, linear movement of objects can be ascertained from any optional, distant location. The view beyond the system is offered to us in the form of a supernova outburst.

Online supporting material:
Becker-Fig-12.tif, Becker-Mov-06.avi

In order to simulate the measurability of the expansion, one adds the space-time scale to this movement. What was outwardly visible without a scale is now measurable with the scale: all objects move away from the center in uniform motion at the same velocity.

Online supporting material:
Becker-Fig-13.tif, Becker-Mov-07.avi

Second stage: in the middle of the expansion
In the second stage, the observer finds himself not beyond, but within the system and his location is fixed.
If one allows the objects to pass by the observer, the initial order of the linear expansion no longer seems as distinct as in the first stage. This view would offer the observer a nearby explosion, which he observes from a fixed point.
The approach and distance of objects can be ascertained in the same way through the observation from a static position. But one does not see any accelerated movements. This static position of the observer does not correspond to our view into the universe.

Online supporting material:
Becker-Fig-14.tif, Becker-Mov-08.avi

The time-space scale helps the observer to spatially orient himself, and thus to understand the linear movements. It is now comprehensible why some objects move further away and others come closer.
The center of the expansion – i.e. the location of the Big Bang – is extraordinarily important for this observation.

Online supporting material:
Becker-Fig-15.tif, Becker-Mov-09.avi

Third stage: component of motion
If the location is no longer static, but the observer moves outward from the origin - as a component of the expansion along with the other objects - then all objects seem to move away from him.

The further away an object is, the faster its escape velocity seems to be.
These movements are exactly those which Hubble first documented:

- All objects are moving away from us.
- Distant objects move faster than nearby objects.

Online supporting material: Becker-Fig-17.tif, Becker-Mov-11.avi

In the simulation it is not possible to discern an order without scale. The specific escape movement cannot be ascertained without a reference point, and so it seems as if one finds himself as a static observer in the center of the expansion.

Online supporting material: Becker-Fig-16.tif, Becker-Mov-10.avi

Only the scale can make this clear with a reference point: all objects apparently move away from the observer, but nevertheless follow a clear, linear trajectory.
The impression of the increased velocity of the distant objects is strengthened through one's own escape movement, and this is why Hubble erroneously came to this conclusion.
One's own escape velocity from the center is not insignificant. It is even greater the stronger one has the impression of increased velocities with regard to the distant objects.
The present 3-D simulation of the linear expansion of the universe tallies exactly with Hubble's observations, without the aid of additional laws of physics.
An explanation for the existence of Dark Matter, which gives rise to the superfluous nature of this phenomenon, is not necessary because this impression also ensues without Dark Matter, so that it can be called into doubt whether this actually exists.

Conclusions

In order to explain the expansion of the universe, we do not alter the laws of physics or mathematical formulas, but we alter our perception and set our location in motion.
The increasing Red Shift in the spectral analysis of increasingly distant objects leads to the conclusion that our location is also in the escape movement of the center.
In the subsequent analysis, we assume the following principles:

- We are not in the center of the universe.
- We are a component of expansion in the universe.
- Our own escape movement is also to be taken into consideration during the evaluation of measurement results.
- It is not necessary to assume an accelerated expansion of the universe in the starting phase.
- For this form of expansion it is not necessary to employ Dark Matter as a corrective mass.
- It is not necessary to assume an expansion of space.
- It is not necessary to assume that light waves also extend into space.

Online supporting material: Becker-Fig-17.tif, Becker-Mov-11.avi

Clarification of open questions:

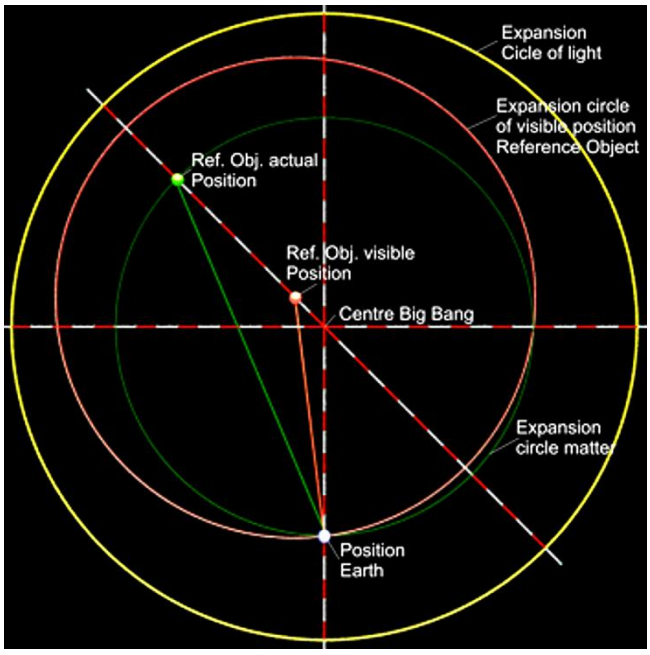
The model of one's own escape movement is sufficient to clarify even further open questions with regard to the expansion of the universe.

- 1. The escape velocity of distant objects (The Red Shift)
- 2. Cosmic Microwave Background (CMB)
- 3. The approach velocity (Blue Shift)
- 4. The early developmental stages of distant objects
- 5. The search for the Big Bang position

Online supporting material: Becker-Fig-18.tif

The escape velocity of distant objects (Red Shift)

If one considers the course of the individual objects in relation to the Earth's own position, a differentiation has to be made between the current actual location of the distant object and its visible location. (With the same velocity = green circle)
The further they move away from our direction of movement, the more time the objects require until the light information has reached our position. The light information follows the laws of Doppler- Effect[12] (red circle). It is not necessary to assume that these light waves also expand with the expansion of the universe. The effect of accelerated expansion of the universe is also represented without this assumption.
The starting point of this movement is always the center of the Big Bang. The current location is a position which can only be calculable for us if we know the location of the center and the object's direction of movement from this location.



Online supporting material: Becker-Fig-31.tif
Actual and visible positions of a reference object.

Reference object 1
Those objects which move away from our standpoint in the opposite direction appear to us as the fastest and oldest. Even if they have the same real escape velocity as the Earth is shown, the object with the direct opposite direction of movement appears to be extremely fast to us and to be in a very early developmental phase.

Online supporting material: Becker-Fig-32.tif, Becker-Mov-20.avi, Becker-pdf-03.pdf

Reference object 2
With the change of the angle, in the same velocity as the Earth, the visible distance of the reference object decreases the more its movements of direction approach ours.

Online-Supporting material: Becker-Fig-33.tif, Becker-Mov-21.avi, Becker-pdf-04.pdf

Reference object 3
Neighboring objects appear to the observer in a substantially lower escape velocity and in a greater age.

Online supporting material: Becker-Fig-34.tif, Becker-Mov-22.avi, Becker-pdf-05.pdf

Reference object 4
One extreme escape velocity shows that the measured distance of a very distant object cannot provide any conclusions to the actual age of the object and the universe. It is a matter of the same velocity as the Earth's location.

Online supporting material: Becker-Fig-35.tif, Becker-Mov-23.avi, Becker-pdf-06.pdf

The velocity of the objects in the universe may show strongly varying measurement results, but are to be evaluated quite differently in real terms. The most important position which has to be located in space is the location of the Big Bang. With this position as the zero point, all other positions can be theoretically calculated.
Since one is only able to record a single "snapshot" in the entire course of the expansion of the universe, one is confronted with the different velocities and ages in the measurements:
We do not see the current locations, but merely the visible locations. This compounds the calculations and challenges us to multilayered consideration of the three-dimensional model of the universe.

Online supporting material: Becker-Fig-36.tif

The horizon of the same velocities
If one draws a horizontal line between all visible objects which move at the same rate as our own escape velocity, this results in an ellipsoid (when seen in three-dimensional terms).
But in this ellipsoid we measure the velocities differently — namely from zero at our location to maximum at the other end. All measured objects on this horizon have the same real velocity, however. This is an ideal model, which does not consider the turbulent flows and gravitational relationships between the galaxy clusters.

Online supporting material: Becker-Fig-37.tif

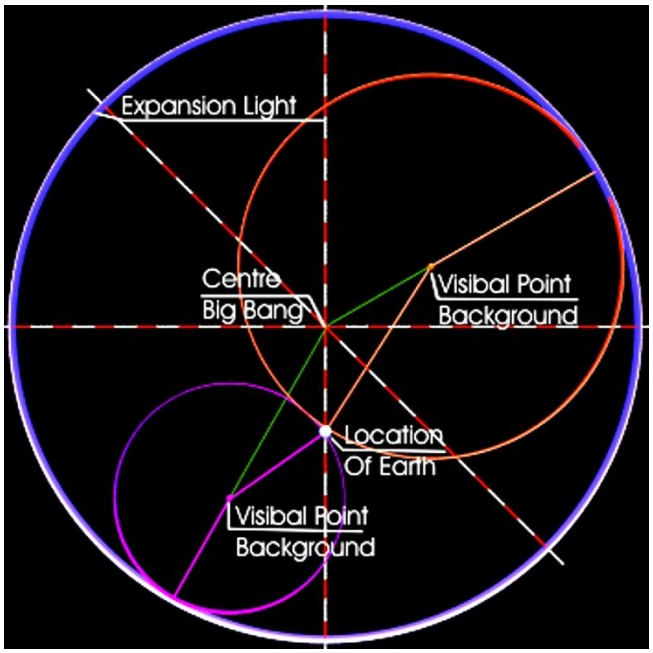
Different real velocities yield other ellipsoidal forms, and so in the ideal model a layer image can be created, which assigns any position in the universe a specific direction of movement and a specific real escape velocity.

Online supporting material: Becker-Fig-38.tif

Cosmic Microwave Background (CMB)

Three different perspectives must be brought together in the model of one's own escape movement. This model does not function in the standard model according to Hubble:

- The outward view into the "nursery" of the universe
- The consideration of the expansion of the universe after the Big Bang, from a small core to a broad sheath
- The consideration of the time which the mirror image requires in order to get back to us from the edge of the universe.



Online supporting material: Becker-Fig-20.tif
The mirror image of CMB to our location

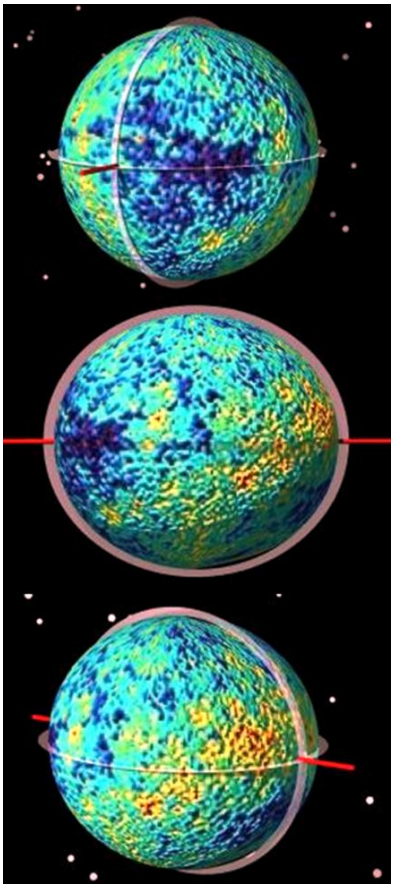
The visible and the current location are determined for the 3rd point. In order to be able to observe furthest possible, visible expansion of CMB from one's own location as a reflection, the light's time span and the distance covered must be taken into consideration, and this point in the universe must be marked (= visible location).
The length of this distance covered is the same at that distance which the light requires in the further expansion up to the current expansion horizon (= current location).
Therefore, the visible location is situated at the center of a circle that simultaneously goes through the Earth and touches the tangents of the light's expansion horizon (current location). Any other points of the light's expansion horizon are ascertained with this method, in order to be able to construct a horizon of the visible background radiation from the multitude of the individual points.

Online supporting material: Becker-Fig-19.tif, Becker-Mov-12.avi

Because of the movement of one's own location, the radii of the surrounding circles between the Earth and the current location are not always the same size. Therefore our visible horizon is not circular.
That means: because we move beyond the center, we also do not obtain any uniform snapshot of background radiation, but rather shots from various time intervals.
Our eccentric position receives images from the distant past and at the same time images of the recent past on the same level of background radiation. The older information stems from the period of the "hotter" phase of the universe, whereas younger images stem from the "cooled-down" period.
Therefore the temperature measure range is very marginal and amounts to 2.725 ± 0.002 Kelvin.
What comes from a distance is still measurable for us as elevated temperature (red). At close range we discern the already cooled-down part of the universe (blue).

Online supporting material: Becker-Fig-21.tif, Becker-Mov-13.avi

Based on the present-day maximum expansion of the universe in the form of light (in the radius of approx. 14 billion light years) on the scale, and based on our notionally covered distance, numerous circles can be formed, in which the centers (as visible locations) mark the horizon of background radiation.



Online supporting material: Becker-Fig-23.tif, Becker-Mov-14.avi
Distinct temperature zones on a 3D-model, shaped as an egg

The sum of all visible locations and the connection of this horizon constitute a puzzle image that collectively results in the image of background radiation.
Due to our eccentric position this horizon is not circular, but oval. When seen in three-dimensional terms, the image of the universe – as it presents itself to us – has the shape of an egg.
If one projects the WMAP 2001 satellite image of background radiation onto an ellipsoid, one simulates that image which is presented to us as the momentary background in the universe.

Online supporting material: Becker-Fig-24.tif, Becker-Mov-15.avi

The projection of background radiation on a three-dimensional model now shows a distinct cold zone as well as a distinct warm zone, and indicates that the theory of one's own escape movement could be corroborated.
However, it must be specifically stated that this image does not correspond to the age of 400,000 years, but has to be much older.

Online supporting material: Becker-Fig-25.tif, Becker-Mov-16.avi, Becker-pdf-01.pdf

The Blue Shift

In the model of the linear expansion of the universe, the maximum approach velocity (Blue Shift) can only be measured in those objects which are situated between the center and the Earth. Only in this zone is the angle at the object between the center and the Earth greater than or equal to 90°. All other objects beyond this circle with angles at the object smaller than 90° are situated in the Red Shift, i.e. in the apparent escape movement.

Online supporting material: Becker-Fig-28.tif, Becker-Mov-19.avi, Becker-pdf-02.pdf

However, for us as observers, the Blue Shift zone is not limitable, since beyond this view the fastest objects would have to be in escape movement at the same time. But this would be exactly the reference in the search for the main axis.

Online supporting material: Becker-Fig-29.tif, Becker-Fig-30.tif

This axis on which the center of the Big Bang is located lies exactly in the viewing direction of the extreme Red Shift as well as the theoretically possible extreme Blue Shift.
The event horizon that we discern takes up a significant radius, and so the age has also attained a substantial magnitude. For this reason it is not possible to see the most distantl galaxies visible in the earliest or initial phase of their developmental stage. A certain limit is reached. What we see are already distinct developmental stages of galaxies in an advanced age. The assumption that it concerns galaxies with an age of a few million years is erroneous. The information from earlier periods has long since moved away from us, and also can no longer be obtained through super telescopes.

The search for the Big Bang position

There are various approaches for finding this Big Bang position:

- The most important reference is the zone of background radiation with the highest temperature. The center of the Big Bang has to be located on this line, which is designated as the zero axis.
- The zone with the greatest accumulation of the most distant objects or the fastest respective escape movement is also located on the zero axis between the Big Bang and the Earth.

- Further references allow the estimation of the distance between the Earth and the Big Bang:
- The specific period of the cooling down of the zones in the background radiation (age)
- The distance between both extreme zones of background radiation (path)
- Cataloging objects of similar velocity in relation to the zero axis (layer model)

Online supporting material: Becker-Fig-36.tif

Summary

Online supporting material: Becker-Fig-01.tif

The three-dimensional animation of an expanding model – in which the observer can place himself in the movement – shows how inexplicable phenomena in the universe can be easily explained without having to correct them with the help of mathematical and physical special rules.
The image and the great order of the expanding universe is thereby more comprehensible for the observer — but not less complicated, since measured magnitudes have new dependencies which must be taken into consideration.
It can be stated:

- We are exposed to a gigantic optical deception. The universe is not expanding at an accelerated rate.
- We are a component of the expansion of the universe. Our view is that of an object moving away from the centre.
- Measured velocities are not to be utilized as actual magnitudes. Measured distances merely represent a snapshot from an earlier epoch.
- The background radiation is a mirror image of the expansion of the universe, which stems from an extended time period, and it simultaneously shows us phases of cooling down during this period.
- It is not correct to assert that the CMB depicts the age of the universe with 400,000 years. It is already several billion years old at the time of our observation. The sheath of this image is presented to us as the ellipsoidal shape of an egg.
- Our view into the universe is not the view to the edge of the universe. It is not correct that the most distantl galaxies visible were already quite distinct after a few million years.
- The most important search applies to the location of the center of the Big Bang. The information pertaining to the Big Bang has already long since moved away from us.

Theories about the accelerated expansion of the universe, Dark Matter, expansion of space and light waves do not stand up to current questions, and are not necessary for the explanation of the history of the universe.
The new approach does not stem from the realm of science, but rather from the three-dimensional geometry in flowing motion. As a result, the open questions will be easily answered, and the way will be paved for a broad field of more detailed research. Is the realm of science ready to accept this approach?
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References:

[1] http://en.wikipedia.org/wiki/Redshift
[2] http://de.wikipedia.org/wiki/Georges_Lemaitre
[3] http://en.wikipedia.org/wiki/Friedmann_equations
[4] Stephen Hawking: The Illustrated A Brief History of Time, 1996,
Bantam Books, New York; new edition Rowohlt publishing house, Hamburg 2004
[5] http://en.wikipedia.org/wiki/Cosmic_inflation
[6] http://en.wikipedia.org/wiki/Dark_matter
[7] http://en.wikipedia.org/wiki/Cosmological_constant
[8] http://en.wikipedia.org/wiki/Cosmological_constant
[9] http://en.wikipedia.org/wiki/Observable_universe
[10] http://en.wikipedia.org/wiki/Cosmic_microwave_background_radiation
[11] http://en.wikipedia.org/wiki/Observable_universe
[12] http://en.wikipedia.org/wiki/Doppler_effect