DRAFT

to discuss

Discussion of the physics of the 4-D-space

Partially abstracted from the book: „Physik des 4-D-Raumes"

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13.01.2023

2nd version 11.01.2024

Inhaltsverzeichnis

1. Initiation

(A very long initiation, it has the aim to pacify the difference of this new physical area and the theory of relativity and to show, that the theory of relativity is a partially not finished theory, maybe with some undiscussed themes, but doesn´t belong to this new physical area. (More you find in the german version of this text).

The following paper shows a new view to our physical room. That means, that our physical three-dimensional world is descripted by theories from the third dimesion.
But if we wag a new view to our physical world from the 4th. dimension, it will be very easy to understand all the paradoxa of the theory of relativity, i.e. the twin paradoxa, and we can find a only one source of the mystery of the time-dilation of the velocity and the time-dilation on gravity. And much more. Don´t worry, it sounds very complex and difficult, but it is so easy to understand it.

In this paper we show you a little calculation to know the size of our universe in the 4th. dimension (until now we only now the visible radial of our universe).

Important:

With this paper I don´t declare, that these theories are the dogmatic truth. It is written for discussing the theory.
Any critic or refute or objective article to improve the theme are welcome.

If you are interested in reading more about this field of physics I recommend the (very cheap) book: "Die Physik des vierdimensionalen Raumes" (sorry for written only in german).
If there are questions, you will (maybe) find me on the net on www.platon-projekt.com or by mail on platon-projekt@mail.ch

2. Three revolutionary approaches are the basics of the new part of physics:

2.1 The basic

All of our common physics can be viewed and declared as a reaction from the sight of the 4th dimension.

This means, that the expanding of our universe in the higher dimension makes it possibly, that our physical laws can work. Like a water wheel, which works only then, when it is put in a flowing water, so will work our physically laws only with the movement of our universe in the 4th dimension.
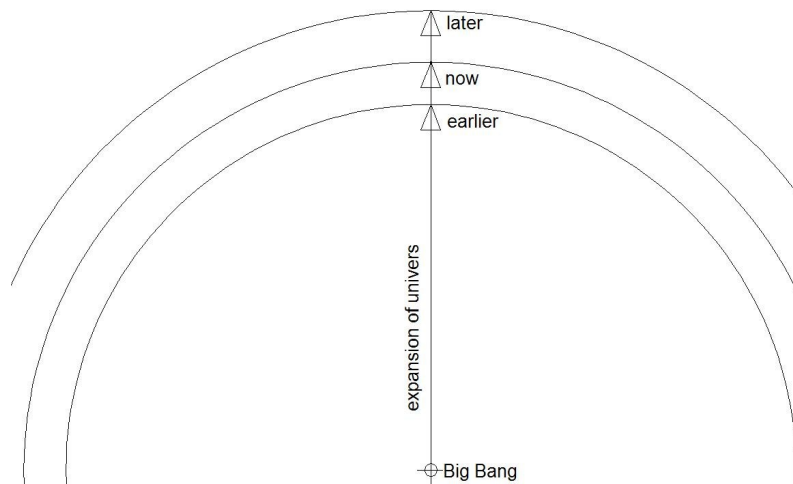

A possible objection to this model I will invalidate. This is the question, why do you use a tangent on a circle, when the universe is tree-dimensional and the circle of the universe must be in a fourth dimension, how you can calculate like a one-dimensional ring?
The answer is simple.
The dimension of a virtual one-dimensional ring (a length, curved in a 2nd dimension) can be calculated with the same diameter as a circular area in the 2nd dimension. And a 2nd dimensional surface of a balloon, curved in the 3rd dimension, has the same diameter as the 1st-dimensional ring. So we can determine, that is the same on a 3rd-dimensional volume, which expands in the 4th dimension. For calculation we only must use the one dimensional circle, as a part of the higher dimensional object.

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2.2 The definition of the time-horizon.

Time-horizon is a virtual tangent on the expanding universe. The time-horizon defines the location of this phenomena, what we sense as time and we can assume, that time is only the changing of a location of our universe in the 4th dimension.
But the definition of the time-horizon can show us the solution of all the paradoxes, which couldn´t explain the theory of relativity. And will let us understand many more questions, which are unsolved till today.
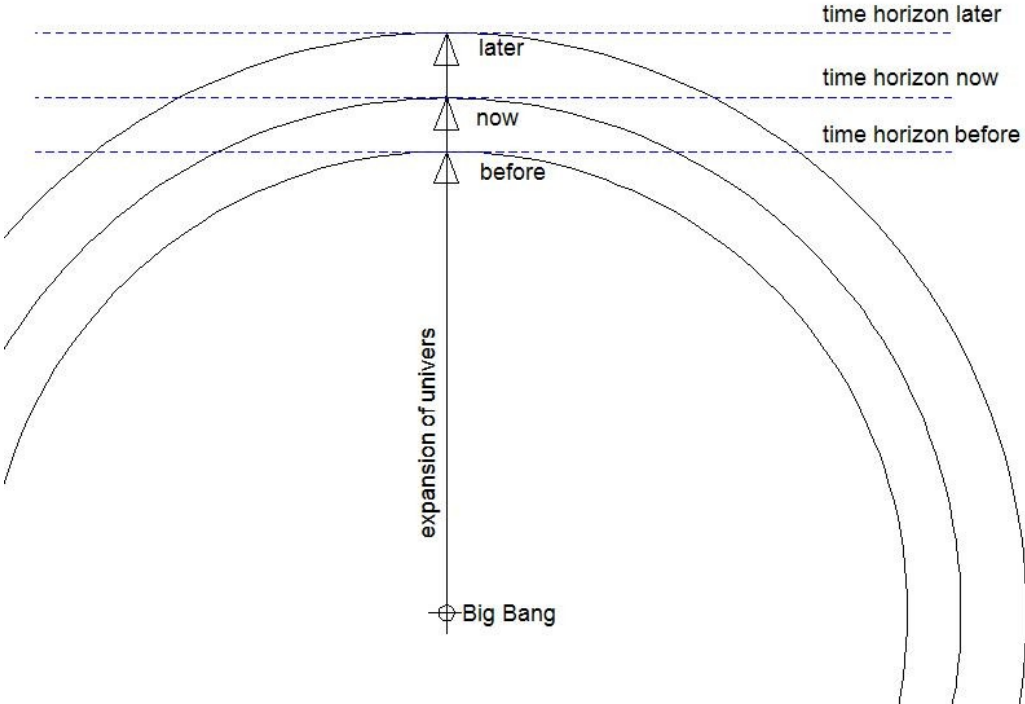
2.3 **The third and most important train of thought**

...is to bring the time-horizon together with the knowledge, that it is finally proven, that on object flying with light-velocity has no change of the time[1].

On the picture we see, that the time-horizon is changing, when (for example) our universe expands in one second.

If in this 1 second an object moves 300.000 km in our universe, we see, that the object reaches a point in the universe in 300.000 km after 1 second. But we also can see, that the object changes the location, but doesn´t change the time-horizon. The time in the object doesn´t change, the time will be zero. The link of time-horizon and the expanding of universe let as calculate how big our universe is until to understand all the paradoxes and many unsolved questions.

(Please note, that the time-horizon will rotate with the distance, but this we can neglect in this first calculating. It will be necessary, when we describe the twin paradoxes of flying away and returning to the twin brother....)..

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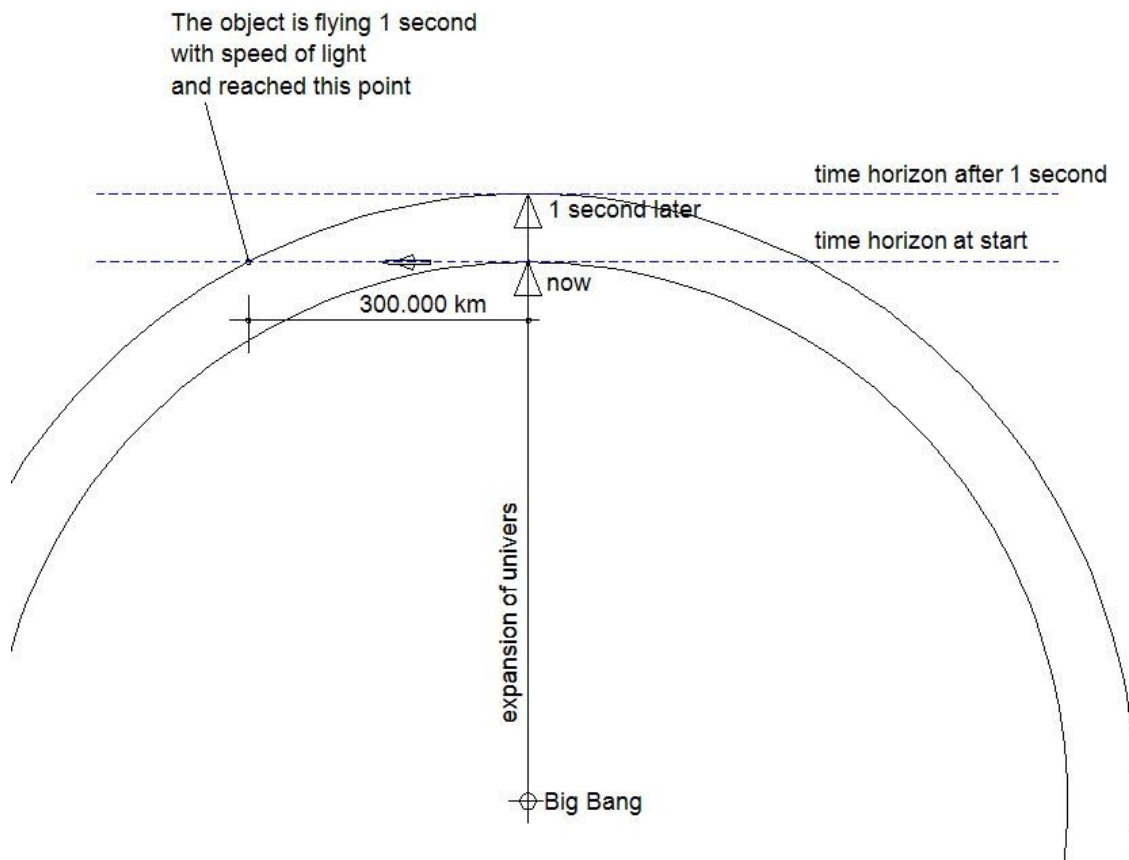
1 Later we will see, that it is not certainly finally proven, that the time on reaching the speed of light will chang to zero. Maybe it will be probably that the zero-time will be on higher velocity or never can be reached.

With these tree basics we are able to solve the following physical problems:

To understand and calculate the paradoxes[2] of the theory of relativity.

To understand and calculate the one and only cause of time and gravity.

To understand and calculate, why time changes with different speed of a flying object.

To understand and calculate, why time changes with the distance over the earth.

To calculate the diameter of our univers in the 4th dimension (see following chapter).

To calculate, how „thick“ is our room in the 4th dimension (how to later).

How we can research by experiments to find a higher speed than speed of light.

How we can research the creation of antigravity (the basics how to do you find in the book (german[3]).

...and many more...

Only in german on website or in the written book you can find many more informations to this new part of physics, for example the critical viewing of the theory of relativity and the Michelson-Morley-Experiment.

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2 Not only to understand the questions of twinparadox on flight and return flight, we solve also the problem what happened, when a flight goes stright in one direction until it will arrive in future in our backside“.
3 View the advertising at end of this script.

3. Calculating the diameter of our universe

Let us immediately begin with the solving of one of the biggest and until now not sol-ved questions: **How big is our universe**.

The only four knowledges of our universe are:

How far we can see in our universe.
How fast a part of our universe is the expanding (Hubble-constant).
We know, that our universe is expanding (red-light-shift).
And, not to forget, the age of the universe is estimated today at about 14 billion years (14.000.000.000).

We are now able with the knowledge of the time-horizon, to calculate the velocity of expanding, the diameter of universe, and all the physical values of our universe in the 4th-dimensional vector.

We begin to calculate the diameter of our universe.

With this calculating you will understand this new theory (it is very simple), and we are able to solve more, until today not solved questions, e.g. the twin-paradox (also solve the question, what happens, if an object will fly in one direction until it reaches (from „behind") the point of departure).

Calculation basics

The following calculation is very simple, it needs no theory of relativity, we can calula-te the diameter of our universe only with the good old geometric calculation of a circle, chord of a circle, tangent of a circle and the radius.

Objection

Of course, you know, that it is not possibly to calculate the diameter of our universe, because you are missing two values:

First you ask yourself, how can we calculate the 4th dimensional diameter of our universe, when we don´t know nothing about the 4th dimensiona room.

And second, you know, it needs for calculating the expanding of our universe some more values,
that means, we know the Hubble constant, but we must know how big is our universe to calculate the whole enlargement with the hubble constant.

So, the conclusion, it is not possibly to calculate the diameter of our universe.

NOPE

First: It is not necessary to know for this problem something about the 4th dimension.
All calculations of the diameter can reduced to a simple calculation of a ring.

I will explain it to you.

The first objection, the unknown circumstances in the 4th dimension:

Imagine, you are a 1-dimensional object, living on a one dimensional line.
You know, that this line is endles and so it must be somehow curved in the next higher dimension to be endless.
Perhaps you find the geometric solution to calculate the diameter of this ring.

Let us see, what happens, when a 2-dimensional object (flat-men) believes, that the two dimensional area is endles.
You know, that to live on an endless surface, the surface must be somehow curved in a next higer dimension.
We, the 3-dimensional objects, know, that the curved 3rd dimension is like a balloon.
And we can calculate the diameter of the balloon by a simple geometric calculation, when we reduce the calculation to a 1-dimensional circle.

Now you see, that it is not necessary, how many dimensions we have to calculate the diameter of the universe in x-dimensions. The calculation of the diameter can every time reduce to the geometric calculation of a ring.

And so you understand, that we can also calculate the diameter of our universe only with the knowledge of a one-dimensional line, curved in the next dimension.

The conclusion is, that the diameter of a universe doesn´t change, no matter how many dimensions we have.

But, remenber, this is only possibly, when our universe expands on all directions evenly. But the evenly expanding is basic of our thinking experiment. And it is not important, because when the expansion is in the 4th dimension different from the expansion in the 3rd dimension, we see, that the shortest diameter of our universe is our calculation basic of a ring.

The second objection, the missing values

We doesn´t need the missing values, because we know the value of time-horizon.

The time-horizon is a virtual tangent on the circle of our expanding universe exactly in this point we are or we will examine.

In the beginning of this text, you see and understand on the grafics, what is the time-horizon.

With this knowledge of the time-horizon we can define the missing value to calculate the diameter of our universe.

And now we make a trick.

We imagine what happens when we fly with lightspeed (that means, that flying with lightspeed the time on the flying object becomes zero.

So, when we fly so fast, that the time of us will reduced to zero (light speed), we can define two points of the expanding universe.

We are flying with lightspeed and reach the starting point = 0.

The second point is the location of us, we reach after 1 second.

(Remember the description of time-horizon is, that we are moving in our universe (here we move on the ring) with exactly the speed, on which the time become zero.

Zero time means, that we are moving laterally on ring, but don´t move upside (in our universe this means, we fly on some direction in our universe, but don´t move in the direction of the 4th dimension)

With this trick we have all necessary informations to solve the diameter of our universe with the simple and good old geometric calculation.
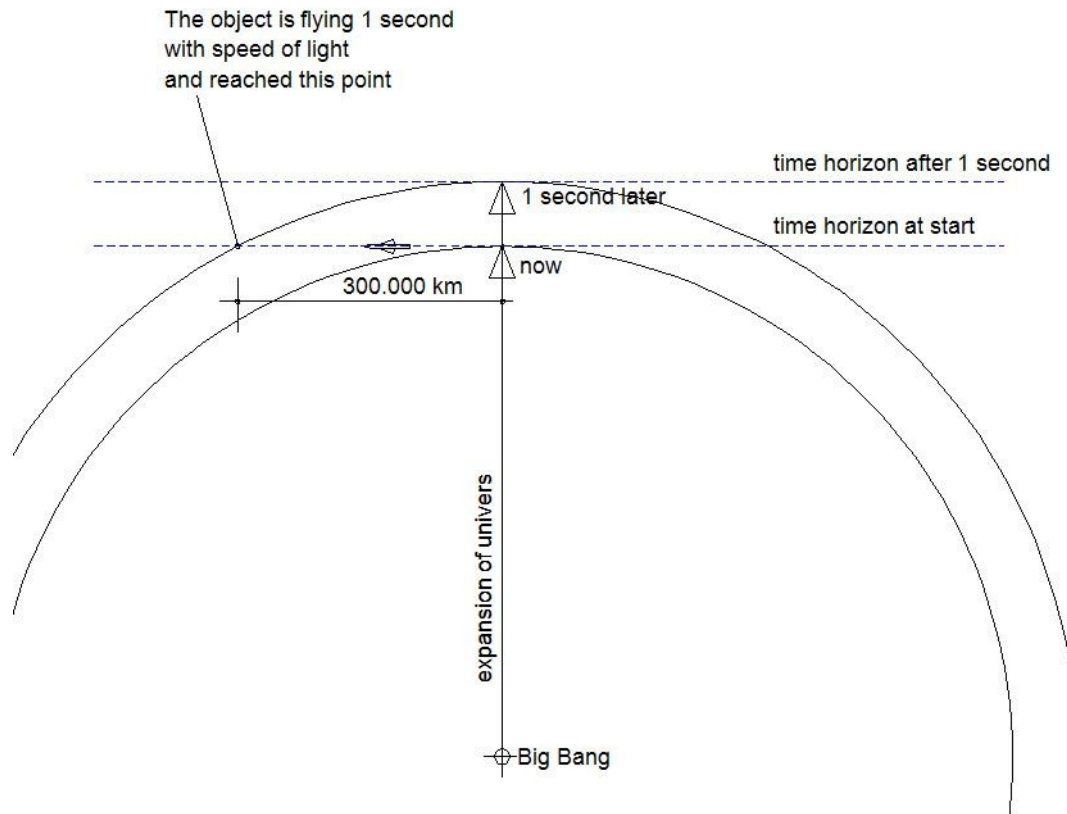
We can see, that a flying object with a speed on speed of light will reach after one second a location, which is defined as:

- 300.000 km away from departure point[4]
- on the same time-horizon-line as on departure (no time changes on flight)[5]
- the universe expanded a distance we don´t know at this moment

Now I will name the values, which are based on this calculation:

- The hubble-constant is 74 km/s each Mpc of the universe
- the assumption, that the universe expands like a sphere

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4 It is a little bit more than 300.000 km, because the expanding of the universe make the real way longer, but this we will take into account in the calculation.

5 The time-horizon-line will rotate a little bit, because time-horizon is every time the tangent on the radius of our universe. But this little changing we will ignore. Later on better calculations we can integrate the value of rotating tangent.
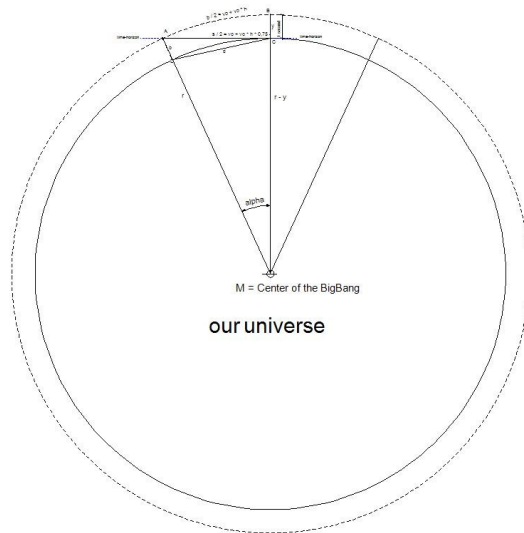
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- the assumptionm that the expanding is an uniformly accelerated movement
- the speed, on which the time of flying object becomes zero, is 300.000 km/s
- the time-horizon is after one second the same line as before without
        interating the rotating of the tangent on the circle[6].
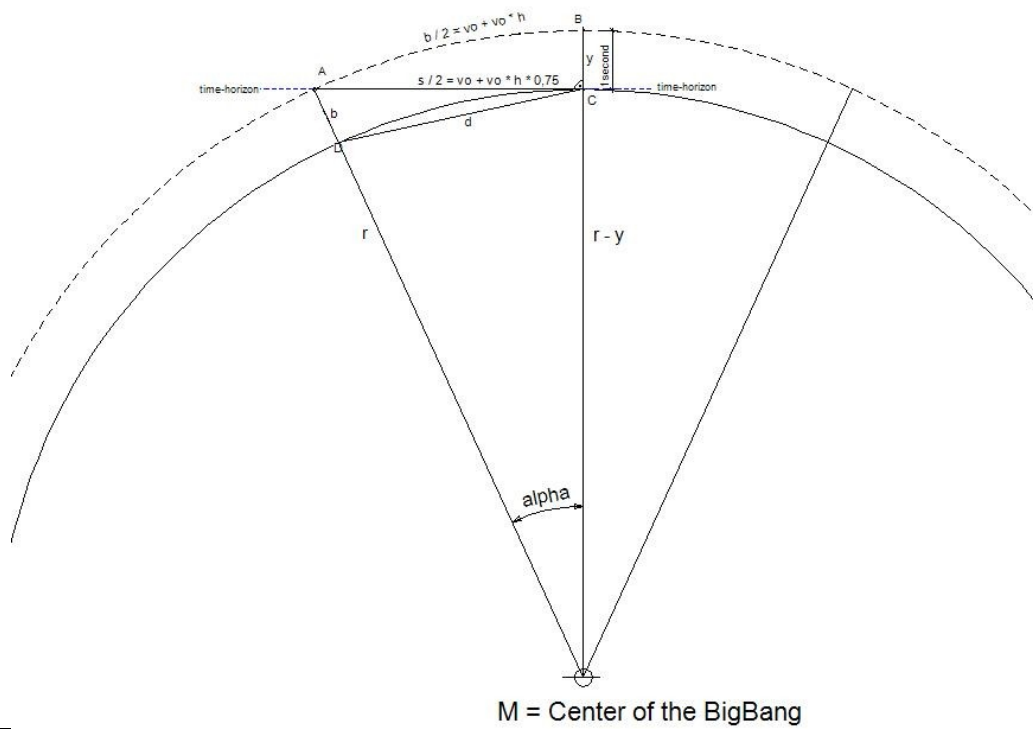
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6 We can neglect this rotating of the time-horizon, because the curvature of the ring is nearly a

The following picture shows the geometric basic to calculate the radius of the universe in the 4th dimension.

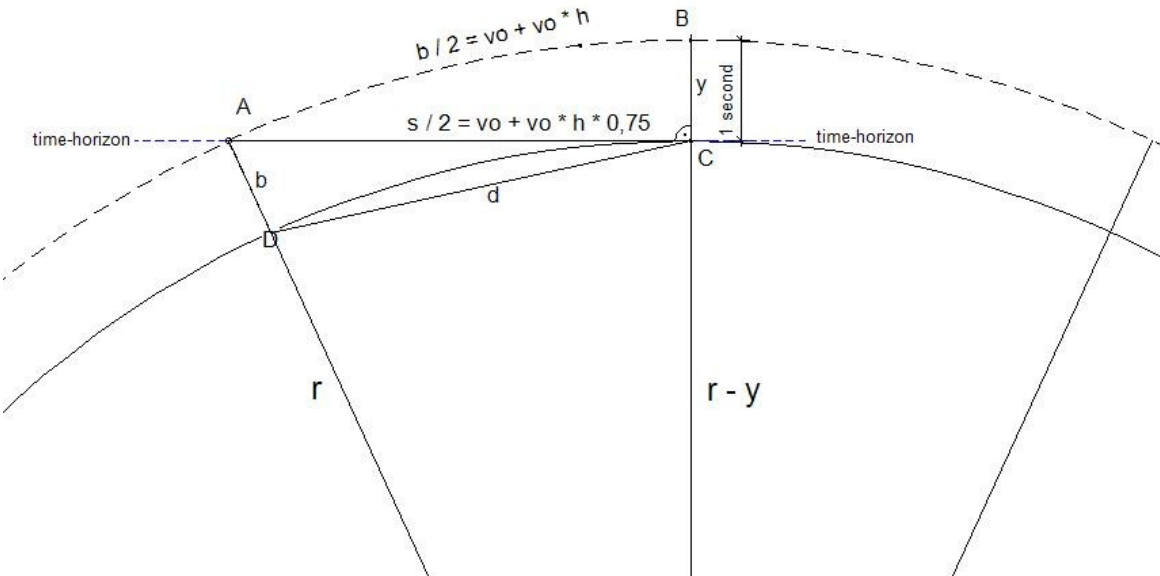An overview of our universe in a flat view (as a ring):

M = Center of the BigBang

our universe

More detail:

$b/2 = vo + vo * h$

$s/2 = vo + vo * h * 0,75$

y

1 second

time-horizon

r

r - y

alpha

M = Center of the BigBang

a better detail:

3.1 The variables

vo = distance, which must be flown by an object with lightspeed in 1 second, so that the object is together with the expanding universe everytime on the niveau of the time-horizon.

vo = 300.000 km (/sec)[7]

Addition:
The basic of this calculation is 1 second. This means, we calculate the diameter of the universe at the time after one second. Normally it is necessary, that we multiply the formulas with 14 billion years (the age of our universe), but this will change the values of calculations, because the numbers are very large. So we will calculate the end-result (for 1 second) and multiply it with 14 billion years.

h = the basic value of the hubble constant (in km/s). h = the expanding lenght of universe of km per second.

This constant must multiplicated with the length vo, so we get the real expanding length of the universe in 1 second and the distance of 300.000 km (/s) after 1 second.

h = 74 km / (s) / Mpc = 74 km / $3,086 * 10^{19}$ km / (s) / Mpc =

h = $2,398 * 10^{-18}$ km (/s/km)

b = viewed arc of the ring of our universe in the 4th dimension.

s = chord length of the arc.

r = radil of our universe in the 4th dimension.

The arc **DC** is the distance, which will fly an object in one second with light speed in the moment of beginning of the flight. This length is in the beginning 300.000 km.

The arc **AB** is the real distance, which the object was flying in one second with light speed after one second flight. And in this length is integrated the enlargement of the universe in the 4th dimension after one second.

That means, the arc **AB** = 300.000 km (in 1 second) + 300.000 * the distance expanding with the Hubble-factor.

And, the arc **AB** is the distance, which an object has flown with lightspeed in 1 second inclusive the expanding length of universe.

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7 Later (maybe not here, but on the full text) we will on the discussion of the Maryland experiment see, that it is not sure, that the time on lightspeed will become zero. It seems, that the zerotime will be reached on a speed very more over the lightspeed.

That means, the length of the arc AB = flying length in 1 second (= 300.000 km = vo) + the the expanding of our universe in 1 second with the distance of 300.000 km.

The length of arc AB = (vo + vo * h) =
= 300.000 km + 300.000 km * 2,398 * 10^{-18}

AB = 300.0000000000000007194 km

The straight line **AC** is the real line, flown distance in 1 second by the object.

(300.000 km + 300.000 km * 23,98 * 10^{-19} *0.75) ([8]).

This distanced of AC is greater than 300.000 km, because of expanding of the universe.
We must add only 0,75 of the expanding of universe (0,75 * h).

And the speed of 300.000 km in 1 second is the exact speed, which let the object moving on a virtual line (= time horizon), which correlates with the expanding universe, so there is no changing on the niveau of the time-horizon in the 4th dimension.

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8 The factor is real on 0.75: The arc DC has the length of 300.000 km. The arc AC has the length of 300.000km + Hubbleconstant h. So the line AC is between full h and 0 h.I have tried on CAD to see how this factor is, and it ensued, that the factor of h is nearly 0.75.

3.2 The calculation
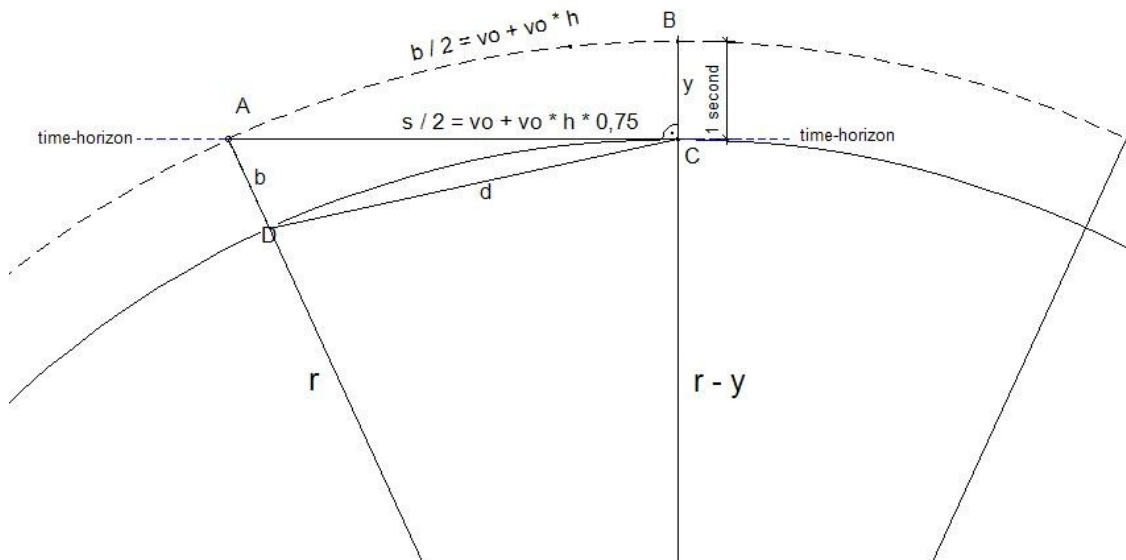
First we need to calculate the angle alpha:

Formula I (circular arc section b will be calculated with radil r and the angle alpha):
b = r * alpha;
→   **r = b / alpha**

Formula II (the length of chord s with r and alpha):

s = 2 * r * sin (alpha/2)
→ **r = s / (2 * sin (alpha/2))**

Now we bring the two formulas together with the same variable r:

$$\frac{b}{\alpha} = \frac{s}{2\sin\left(\frac{\alpha}{2}\right)}$$

Normally this formula is not to calculate (not for me with my little computer), so it is necessary to make the following trick:
We change and separate both sides of the formula above and calculate each site by itself.

$$\frac{s}{2\,b} = \frac{\sin\left(\frac{\alpha}{2}\right)}{\alpha}$$

We know, that the left part of equation is:

b/2 = vo + vo * h; -->   **b** = 2 * (vo + vo * h)
s/2 = vo + vo * h*0,75; --> **s** = 2 * (vo + vo * h*0,75)

we change the left term

s / (2*b)   to:

(2 * (vo + vo * h*0,75)) / (2 * 2 * (vo + vo * h))   = $\dfrac{2\,(v\,o + v\,o\,(h \times 0.75))}{2 \times 2\,(v\,o + v\,o\,h)}$

=

$$\frac{2\,v\,o\,(1 + h \times 0.75)}{2 \times 2\,v\,o\,(1 + h)}$$

we eliminate vo and 2, and we get the left term to:

$$\frac{1 + 0.75\,h}{2 + 2\,h}$$

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(Notice: On left term vanished the length of lightspeed (vo) in 1 second, we see, that this part of the formula is only definited by the value of Hubble (h)).

So, in the left term exist only the variable h (you know it is the hubble constant), and we are now able to calulate both terms to a number:

$s / (2 * b) = \quad (1+23.98*10^{-19}*0{,}75) / (2+2*23.98*10^{-19})$

with $h = 2{,}398*10^{-18}$ (see above)

we get $((1+2.398E-18*0.75)) / (2 * (1 + 2.398E-18)) = \sin(alpha/2)/alpha$

$$\frac{1 + 2.398 \times 10^{-18} \times 0.75}{2\left(1 + 2.398 \times 10^{-18}\right)} = \frac{\sin\left(\frac{\alpha}{2}\right)}{\alpha}$$

The result is alpha

→ **alpha = 2,75*10^{-22}**

(Notice: For the calculation I use the very exakt programm on web:
https://www.wolframalpha.com/   )

Now we know the angle alpha and the known length of the arc AB. We are now able with a little and simple geometric knowledge to solve the formula and find the radial r

r = b/alpha

We know, that the angle alpha is defined by the value of lightspeed in one second. But the view on the two formulas shows us, that the angle alpha will be everytime the same in the viewed area, no matter how the length of the variable b (AB) is, alpha is only defined by the Hubble-constant. And alpha is only defined by the the line of the time-horizon.

We can write the variable in the formula and are able to calculate the radix r:

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$$r = \frac{2\,vo\,(1+h)}{\alpha}$$

with alpha = $2,75*10^{-22}$
and h = $2,398 * 10^{-18}$
and vo = 300000km

we get

r = radial of our universe = $2,182 * 10^{27}$ km (after one second after big bang)

in light-years:

$2,182*10^{27}$ / 3600/24/365/300000 = **r of our universe = $2,31*10^{14}$ light-years**

This is the radial of our universe 1 second after the big-bang.
If you are interested in the beginning of our universe, you can calculate the radial after a half second, after a millisecond etc….

But for today we are interested, how big is our universe today, after 14 billion years after the big-bang.

So we have to multiply this radial of one second with 14 billion years.

$2,31 * 10^{14}$ * 14.000.000.000 * 365 * 24 * 3600 =

$1,02 * 10^{32}$ light-years today.

3.3 Discussion of the result

Enjoy the result and now you are very easily to calculate the next variables, i.e. the length of the surface as a 4th-dimensional ring (2 * r * pi), and the velocity and length of the expanding of our universe in one second (for example).

Important is, that you now understand the use of the time-horizon after this practical exercise.

But wait.

This first value of the radix of our universe is only a minimum value. Remember, that we have based this calculation on the knowledge, that on lightspeed the time will become zero.
But this is not so secure as it is told to us.
There exist no correct proof, that the time become exactly zero on reaching the lightspeed. The only try to proof it is by the measuring of the myons, but this is no exact proof. Maybe I will explain this later. On the german version I declared the problems of this situation and show, as a
example the maryland-experiment, that the speed with the time zero must much more higher as the lightspeed.

Never mind, you know now the function of the time-horizon.

And at last on this little paper we will calculate the diameter of our universe with a more possibly speed, on which the time become zero.

In the book „Physik des 4-D-Raumes" we calculate the time-dilation of the maryland-experiment and see, that the probably real speed, on which the time will go to zero, can be $1,325*10^{12}$ km/s,
and now we will calculate the radial of our universe with this new varable
vo = $1.325*10^{12}$ km/s

We insert this value in the formulas above and get:
r = $9,64*10^{33}$ km
in lightyears: r = $9,64*10^{33}$ / 300.000 / 3600/24/365 =

Radial r of our universe = 1,02*10²¹ lightyears after 1 second

1.02*10²¹ * 14.000.000.000 * 365 * 24 * 3600 =
4,5 * 10³⁸ light years today

End of calculation

More, about the twinparadoxa, the time-dilation, mass and acceleration and the possibly basics of anti-gravity you will see on the german book: „Neue Theologie Physik Indizien Experimente"