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A New Law of Gravitation: A New Theory about Inflation and the Big Bang

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Abstract: ***Here we present a new theory of the inflation and the Big Bang. This theory is in the framework of developing a new Law of gravitation, which is the responsible of the Big Bang, doing by gravitation, and the characteristic of the inflation is in accordance with the model. In the model the Hubble law is to be differ to other model and is continuously varied permanently from the beginning and to the end being more higher in the cero point of the Universe and cero to r to find to be infinite. In our theory the mass is continuously create during the expansion, and we calculate the temperature of this mass being the value of 3K. We calculate the density of the Universe by the anisotropy and find close to the dark mass of the universe, en close to the critical density to be required. In the theory we demonstrate the anomalose Hubble diagram of the supernovas is only a mirow of the new law of gravitation, and the dark energy does not exist.***

Keywords: general relativity, inflation, Big Bang model, cosmology

1. Introduction

The inflation has a generalized success to explain the consideration by the question that standard Big Bang model. The inflation predicted an expansion al several order of magnitude the size of the Universe to account the horizon problem. Also it is responsible of the non curvature of the Universe, and the monotony of the Universe. But the inflation has a several problem, does not explain the Big Bang, only responsible of the empty energy, which is the unknown source. Does not explain the inflation only by a inflation and does not explained the end of inflation. All of this enquire are denoting by ad-doc supposition. The actual model is based in the Universe flat de Sitter, with constant Hubble constant, and it is impossible to see how the inflation of the inflationary Universe to finally see the constant Hubble constant. It is hard to understand which is this processed and the finally understand the end of inflation. The inflation is putting ad-doc, and can be understand without previous supposition. In the new theory presented here, and the new law of gravitation all these presessed is easy understand by gravitation and the Big Bang also the inflation are Universe is understand by the gravitation force. Unlike the present model, the Hubble constant is not constant, and this is varied of all the expansion of the Universe, the inflation is a exposition more of the model and it is the expantaneous concession between the expansion processed. We explain all of this by the gravitation, and is time to introduce the deduction of the new law of gravitation.

2. A New Law of Gravitation

The two simple assumptions of the Equivalence Principle (EP) of General Relativity (GR) are that the special relativity is locally valid in each point of a Gravitational Field (GF), and the GF is equivalent to an accelerated reference frame. In this paper we use the EP in the way it was postulated. Without assuming any curvature of the space, we will deduce the GF at rest frame centered in the mass M from the frame of a test particle moving freely about the coordinate center. This can be considered as an alternative solution to the general relativity. The present deduction is only valid for radial movements. For more general solutions, like the planet movements in a GF, we have to consider the transversal velocity.

3. The Rest Frame Gravitational Field

The analysis we will use in this section, has already developed by Rindler (1977). In order to find the relation between the accelerations in two reference frames, in the context of special relativity, he defined the proper acceleration, which is the acceleration of a particle respect to its instantaneous rest frame. Here we use his simple argument to be applied to a gravitational field, and then obtain an unexpected independent solution for the general relativity, only valid for radial movements.

We consider a GF of a puntual mass M at rest, and a test particle moving freely. Let S be the reference frame centered at rest in this puntual mass. Let S’ be a frame moving with constant velocity v. Both reference frames are in standard configuration, i.e. their origins at t = 0 and their axis in the direction of motion coincide. Let w and w^t be the velocities of the particle, measured in S and S’ respectively. According with the EP, in every local instantaneous position, the particle is moving with constant velocity. Because there is no restriction about this velocity, it can be taken as v. Thus, momentarily, S’ is the rest frame of the particle, with $w^t = 0$ and $w = v$, being v constant, while w and w^t are not. By definition both reference frames are inertial. Consequently, we can use the special relativity equations in each point, to derive the relation between acceleration in both reference frames. After that, we will assume an inverse square law for the acceleration in the moving frame S’, and obtained the field in the rest frame S.

From special relativity, we have

$$w = \frac{(w' + v)}{(1 + w'v/c^2)}$$

then

$$dw = \frac{(1 + w'v/c^2) - (w' + v)v/c^2}{(1 + w'v/c^2)^2} dw'$$

Since momentarily
$w' = 0$ and $w = v$,
The equation becomes as follow:

$$dw = (1 - w^2/c^2)\ dw' = \gamma^{-2}(w)\ dw'$$

by time dilation $dt' = dt\, \gamma^{-1}(w)$.

$$\text{Let } \alpha = \frac{dw'}{dt'}$$

be the acceleration of the particle respect to its instantaneous rest frame S'.

Thus,

$$dw = \ \alpha\ dt\ \gamma^{-3}(w)$$

and

$$\frac{dw'}{dt'} = (1 - w^2/c^2)^{-\frac{3}{2}}\ \frac{dw}{dt}$$

This last equation relates the acceleration in both reference frames. Now we introduce an inverse square law for the acceleration in the S' frame, and obtain the gravitational field in S. Let r and r^t be the instantaneous distance modulus between the origins of S and S', measured in first and second frames, respectively, and in addition we assume the particle position in S' is cero. Thus we have

$$\frac{dw'}{dt'} = -\frac{GM}{(r')^2}$$

by length contraction

$$r' = (1 - w^2/c^2)^{1/2}\ r$$

$$\frac{dw'}{dt'} = -\frac{GM}{r^2}(1 - w^2/c^2)^{-1}$$

or

$$\frac{dw/dt}{\sqrt{1 - w^2/c^2}} = -\frac{GM}{r^2}$$

The first member can by written as

$$\frac{(dw/dr)(dr/dt)}{\sqrt{1 - w^2/c^2}} = \frac{wdw/dr}{\sqrt{1 - w^2/c^2}}$$

To integrate this equation, we introduce the variable $\sigma = w^2/c^2$

So
$d\sigma = 2\, w\, dw/c^2$

Then we have

$$\frac{c^2}{2}\frac{d\sigma}{\sqrt{1 - \sigma}} = -\frac{GM}{r^2}dr$$

integrating

$$-c^2\sqrt{1 - \sigma} = \frac{GM}{r} + C$$

We take $w = 0$ at $r = \infty$,

then $C = -c^2$, and

$$\sqrt{1 - w^2/c^2} = \left(1 - \frac{GM}{c^2 r}\right)$$

Or

$$\frac{dw}{dt} = -\frac{GM}{r^2}\left(1 - \frac{GM}{c^2 r}\right)$$

This is finally the force per mass unit in a reference frame at rest S. We can consider the introduction the inverse square law; because the acceleration must be reduce to the newtonian type when la distances are large.

4. Lorentz Invariance

We will see now if the new equation is invariant under the Lorentz trans- formation. The Lorentz transformation of the acceleration has already been deduced in section 2. It is

$$\frac{dw'}{dt'} = (1 - w^2/c^2)^{-\frac{3}{2}}\ \frac{dw}{dt}$$

Then, we assume

$$\frac{dw'}{dt'} = -\frac{GM}{r'^2}\sqrt{1 - w'^2/c^2}$$

and

$$\frac{dw}{dt} = -\frac{GM}{r^2}\sqrt{1 - w^2/c^2}$$

Taking into account the length contraction, both equations satisfy the trans- formation law with the special condition wt = 0. For the second equation we applicate the length contraction and it is:

$$\frac{r'^2}{(1 - w^2/c^2)} = r^2$$

and the first equation is:

$$-\frac{GM}{r'^2}\sqrt{1 - w'^2/c^2} = -(1 - w^2/c^2)^{-\frac{3}{2}}(1 - w^2/c^2)^{\frac{3}{2}}\frac{GM}{r'^2}$$

then the equation is:

$$-\frac{GM}{r'^2}\sqrt{1 - w'^2/c^2} = -\frac{GM}{r'^2}$$

Then for w'=0 the two member of the equation are equal.

For $w^t = 0$ the transformation doesn't happen. However, as we have seen in section 2, $w^t = 0$ is the condition si ne equanon to validate the equivalence principle (also $w = v$). For any other value $w^t = 0$, the equivalence principle does not accomplish, and then, there is no law of gravitation at all to be transformated. Consequently, it has no sense to transform the new law of gravitation for values for which $w^t = 0$. w is cero at infinity and can reach the value c at a given position (see below), thus all possible velocity can hap- pen, and the Lorentz transformation is always referred to the instantaneous rest frame of the particle, i.e. inevitably for $w^t = 0$.

5. Some comments about the new law

This equation has to be considered as an alternative solution of general relativity, but only valid for radial movements. To deduce a more general expression, with the same line of arguments, we should also consider the movement in the transversal direction. Otherwise, the present deduction has important consequences for special cases. It could be valid, for example, for a non rotating black hole, and for a expanding homogeneous universe. The new equation is a modified newtonian law. Unlike the square law alone, the strength becomes lower at shorter distances. At smaller distances the force become cero. This distance corresponds to the factor between brackets equal cero, i.e.

$$\left(1 - \frac{GM}{c^2 r_0}\right) = 0,$$

Or

$$r_0 = \frac{GM}{c^2}$$

We now to compare the force between the New Law and without this. In the surface of the Earth the difference is a factor one minus 10^-10, which is an insignificant value, which give its serious of the point of view the New Law of Gravitation. In order to solve the fundamental test that validates the New Law of Gravitation we move in the orbit It is interesting to see that two movil to turn around a central body, the behavior is different with the New Law of Gravitation and without this. We start with the newtonian pictures. In this case the orbits are ellipses but with the new Law of Gravitation the ellipse are equal in form and orientation but the size is bigger.

By suggestion of his friend Elmundt Halley, who though that the planet to turn around the Sun with a force inversely to the square of the distant to the Sun, Issac Newton take this law as himself and is generalized for all bodies. Newton does not demonstrate nothing, the law that it is take your name is putting ad doc. We put ad doc the law in our New Law of Gravitation too. If the Newton law is true but putting ad doc, our New Law of Gravitation also has been validation too, of course. Why does not a New Law that is validation in a impeccable deduction in developed the formula, which is the New Law of Gravitation

This it is half the Schwarzschild radius. At shorter distances of this value, the force becomes repulsive. The new equation is consistent with the newtonian limit, since the repulsive forces appear at very short distances, and at scales which the gravitation is usually measured, the repulsive force is not detected. However, as we will see later, at cosmological scale, the new law of gravitation set up radical different picture as the current view.

It can be shown that if the particle starts at rest at the infinity, then reaches the velocity c at r_0, and because the deceleration is present at lower r_0, the velocity becomes cero at $\frac{r_0}{2}$. Inversally, starting at rest in the last value, the particle accelerates and to the velocity c at r0, and after that, the particle velocity drops to cero at infinity, because the desaceleration is present further r_0. At lower $\frac{r_0}{2}$ the velocity is not real but the kinetic energy it is.

6. The New Law of Gravitation and the Dark Energy

The usufructuaction of the new law of gavitation, can be used to explain the Big Bang. The Big Bang is produce by the violent exploitation by the repulsive gravitation when the distant between the subject are more less. It is produce an empty space that full of radiative radiation cause the creation of material. Between several thing to be explanation through the new law, are the decreasing period of the binary pulsars to be responsible to the gravitational radiation, the jet apposite in quasar, the non formed black holes, the advances of Mercury perielio and the low acceleration of Pionner 10 and 11. But the thing with more is related with the Big Bang is the dim of supernovas in the Hubble diagram, which is the source of dark energy. We explained the new law is the responsible of this dim the supernova. In the Figure 1 we have the supernovae in the Hubble diagram, and which it is show the appartament between the full line (see Reiss et al 1998). By this discovery three scientist were lauread by the Nobel Prize in Physics: Purlmeter, Schmidt and Reiss in 2011. When the attraction is normal the supernova are in a distance, but when the low value of the new law the distances are large and the dim of supernovae, like it is show in Fig 1. We calculate the attraction of the

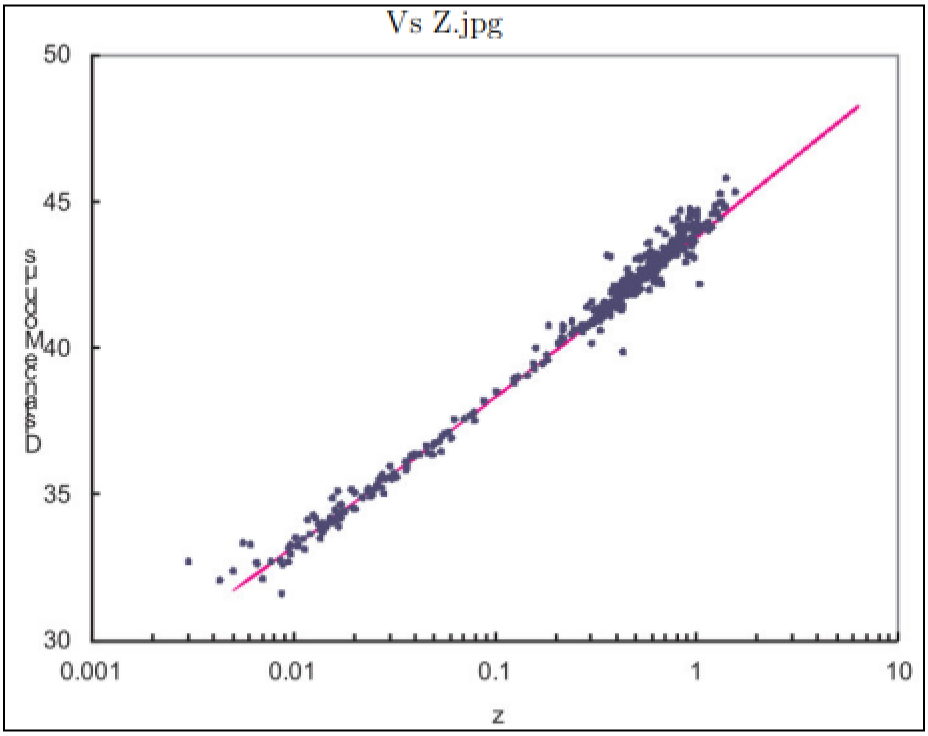


Figure 1: The distribution of supervovae in the Hubble diagram

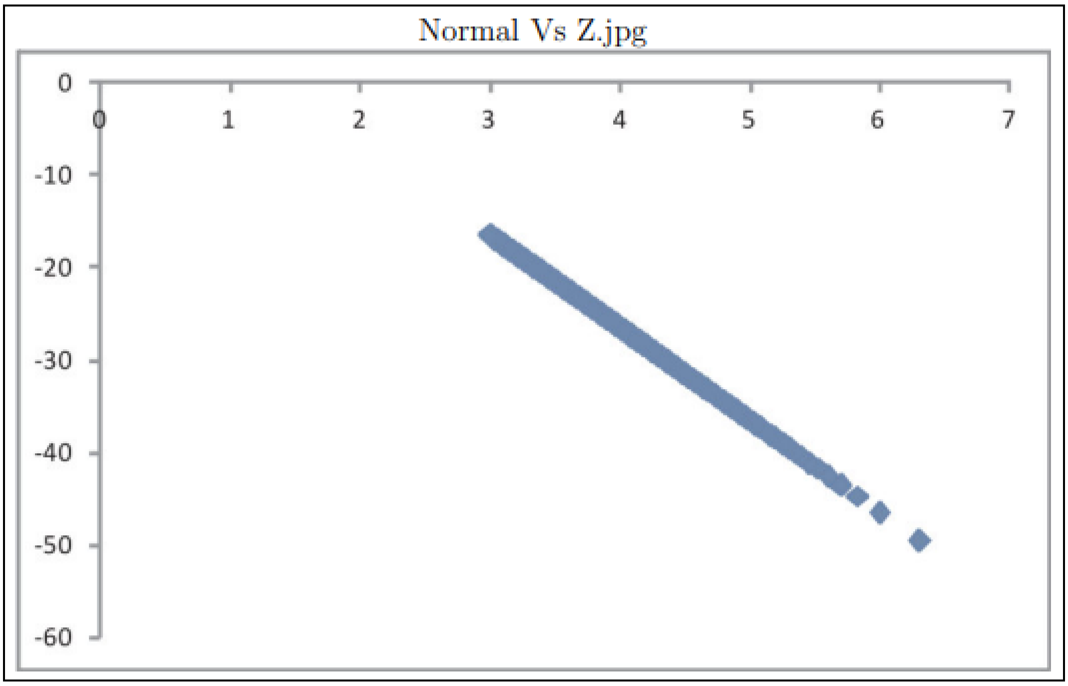


Figure 2: Here we can see the attraction of the normal neutonian attraction Fuerte Vs Z.jpg

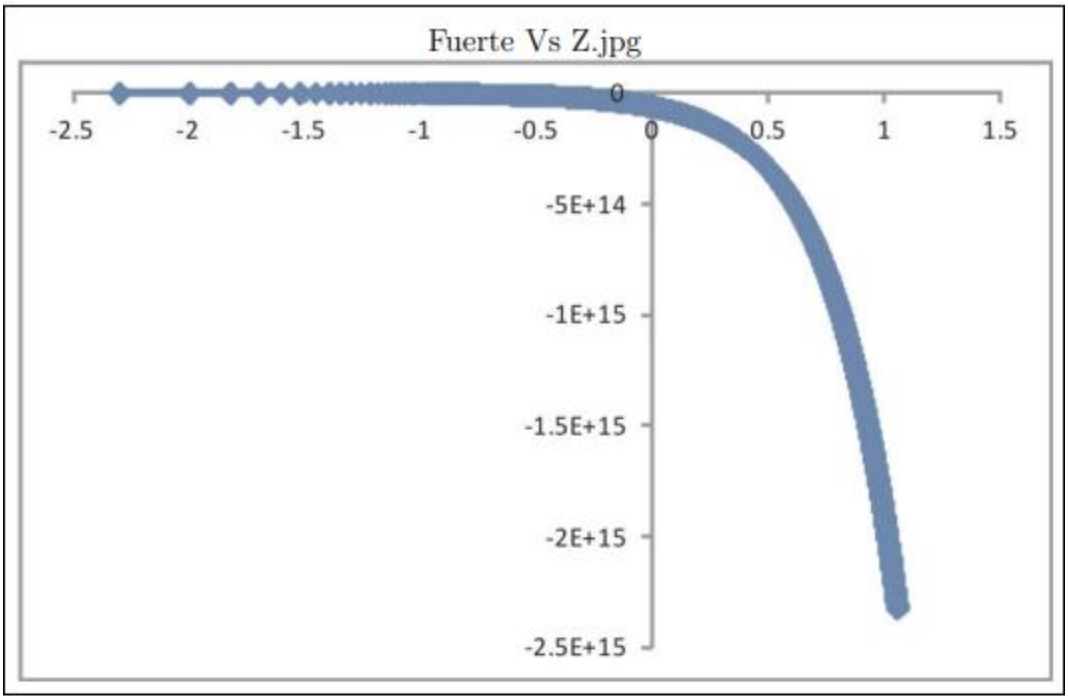


Figure 3: Here you have the attraction of the new law of gravitation

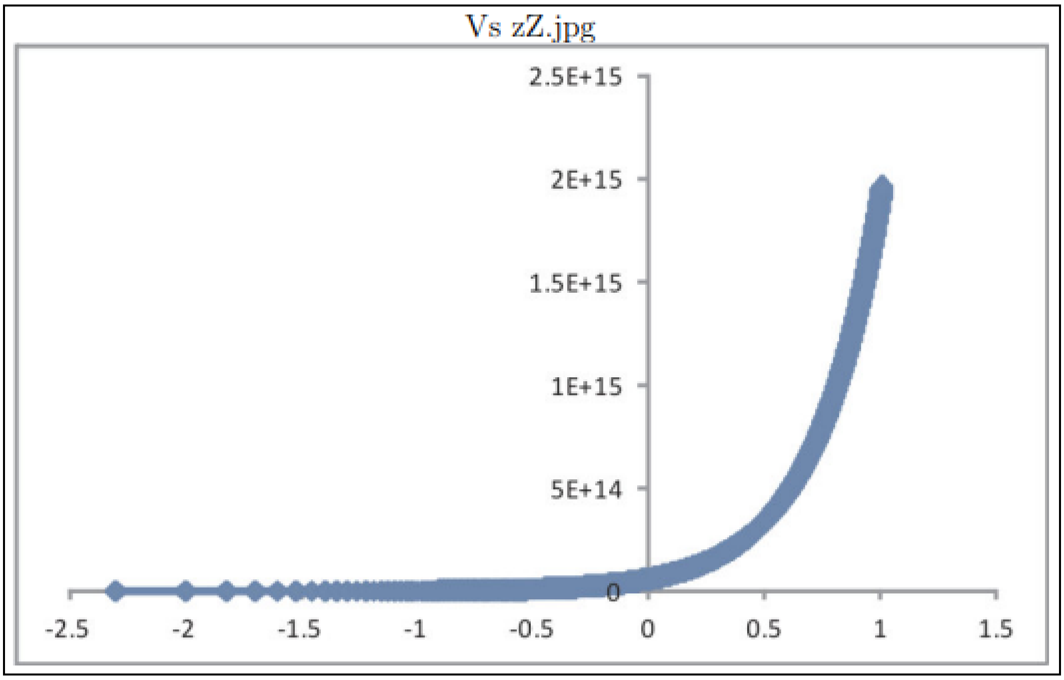


Figure 4: Here you have the difference beteewing the result of Fig 2 and Fig 3

supornova and the attraction of our new law. The result is in Fig 2 and 3, and in Fig 4 is the differences between them. We can see the differences between them are in accordance with the apartation of supernova in Fig 1 from the close line. The results of Figure 4 is very important, and we see that the Dark Energy does not exist.

7. The New Theory

Here we deal with a paper that put the theory of the Big Bang OK [5]. The theory does not explain what are the cause of Big Bang. This is because the distance of the bodies in the New Law of Gravitation is so close that is repulsive

The Big Bang is produced by the violent unexpected explotion from product of repulsive gravitation.

In the equation $\frac{d\omega}{dt} = \frac{GM}{r^2}\left(1 - \frac{GM}{c^2 r}\right)$, the factor between the brackets are negative at sufficient small distances. The equation gives a anti- gravitation which is produced the explotion. It is produced an empty space where the high degree of radiation cause the creation of the matter. If we will constructed the parameters of the Universe we have

Table 1

R (pc)	H(Km/s/Mpc)	Age (sec)	M(Kg/pc^3)	Dens (Kg/pc^3)	Temperature	Ninf	Et	Ek	En	E=Et+Ek+En	M=E/c^2
0	#¡DIV/0!	0	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!
1.00E-60	3.7037E+254	1E-187	3.33E-144	1.11E-100	1.984E-136	67.56863624	1.25E-275	#¡NUM!	3.333E-127	#¡NUM!	#¡NUM!
1.00E-50	3.7037E+214	1E-157	3.33E-124	1.11E-90	1.984E-116	57.56863624	1.25E-235	#¡NUM!	3.333E-107	#¡NUM!	#¡NUM!
1.00E-11	1.48148E+59	1E-40	3.33E-46	1.11E-51	1.9841E-38	19.17069623	1.25E-79	3.658E+72	3.3333E-29	3.658E+72	3.658E+55
1.00E-10	1.14815E+56	1E-37	3.70E-44	1.23E-50	2.2024E-36	19.05956342	1.5401E-75	2.4388E+68	3.7E-27	2.4388E+68	2.4388E+51
0.000000001	1.11481E+53	1E-34	3.70E-42	1.23E-49	2.2024E-34	19.04676822	1.5401E-71	2.2992E+64	3.7E-25	2.2992E+64	2.2992E+47
0.00000001	1.11148E+50	1E-31	3.70E-40	1.23E-48	2.2024E-32	19.04546772	1.5401E-67	2.2855E+60	3.7E-23	2.2855E+60	2.2855E+43
0.0000001	1.11115E+47	1E-28	3.70E-38	1.23E-47	2.2024E-30	19.04533746	1.5401E-63	2.2841E+56	3.7E-21	2.2841E+56	2.2841E+39
0.000001	1.11111E+44	1E-25	3.70E-36	1.23E-46	2.2024E-28	19.04532443	1.5401E-59	2.284E+52	3.7E-19	2.284E+52	2.284E+35
0.00001	1.11111E+41	1E-22	3.70E-34	1.23E-45	2.2024E-26	19.04532312	1.5401E-55	2.284E+48	3.7E-17	2.284E+48	2.284E+31
0.0001	1.11111E+38	1E-19	3.70E-32	1.23E-44	2.2024E-24	19.04532299	1.5401E-51	2.284E+44	3.7E-15	2.284E+44	2.284E+27
0.001	1.11111E+35	1E-16	3.70E-30	1.23E-43	2.2024E-22	19.04532298	1.5401E-47	2.284E+40	3.7E-13	2.284E+40	2.284E+23
0.01	1.11111E+32	1E-13	3.70E-28	1.23E-42	2.2024E-20	19.04532298	1.5401E-43	2.284E+36	3.7E-11	2.284E+36	2.284E+19
0.1	1.11111E+29	1E-10	3.70E-26	1.23E-41	2.2024E-18	19.04532298	1.5401E-39	2.284E+32	3.7E-09	2.284E+32	2.284E+15
1	1.11111E+26	1E-07	3.70E-24	1.23E-40	2.2024E-16	19.04532298	1.5401E-35	2.284E+28	3.7E-07	2.284E+28	2.284E+11
5	8.88889E+23	1.25E-05	1.03E-22	6.89E-40	6.1508E-15	19.04226916	1.2012E-32	4.0823E+25	1.0333E-05	4.0823E+25	408230452
10	1.11111E+23	1E-04	5.83E-22	1.94E-39	3.4722E-14	18.98776554	3.8281E-31	3.6008E+24	5.8333E-05	3.6008E+24	36008230.3
20	1.38889E+22	0.0008	2.33E-21	3.89E-39	1.3889E-13	18.98776554	6.125E-30	2.2505E+23	0.00023333	2.2505E+23	2250514.39
100	1.11111E+20	0.099999997	4.13E-20	1.38E-38	2.4603E-12	19.04226915	1.922E-27	2.5514E+20	0.00413333	2.5514E+20	2551.44025
200	1.38889E+19	0.799999952	2.33E-19	3.89E-38	1.3889E-11	18.98776552	6.125E-26	2.2505E+19	0.02333333	2.2505E+19	225.051426
300	4.11523E+18	2.699999757	6.33E-19	7.04E-38	3.7698E-11	18.89314728	4.5125E-25	5.3628E+18	0.06333333	5.3628E+18	53.6277726
400	1.73611E+18	6.399999232	1.23E-18	1.03E-37	7.3413E-11	18.80777918	1.7112E-24	1.8587E+18	0.12333332	1.8587E+18	18.5868351
500	8.88889E+17	12.49999813	2.03E-18	1.36E-37	1.2103E-10	18.73417723	4.6512E-24	8.0329E+17	0.2033333	8.0329E+17	8.03292035
600	5.14403E+17	21.59999611	3.03E-18	1.69E-37	1.8056E-10	18.67034504	1.0351E-23	4.0133E+17	0.30333327	4.0133E+17	4.01326211
700	3.23939E+17	34.2999928	4.23E-18	2.02E-37	2.5198E-10	18.61426698	2.0161E-23	2.2212E+17	0.42333322	2.2212E+17	2.22115619
800	2.17014E+17	51.19998771	5.63E-18	2.35E-37	3.3532E-10	18.5643741	3.5701E-23	1.3265E+17	0.56333316	1.3265E+17	1.32650956
900	1.52416E+17	72.89998032	7.23E-18	2.68E-37	4.3056E-10	18.51948955	5.8861E-23	8.4017E+16	0.72333309	8.4017E+16	0.84017211
1000	1.11111E+17	99.99997	9.03E-18	3.01E-37	5.377E-10	18.47872662	9.1801E-23	5.5761E+16	0.90333299	5.5761E+16	0.55761296
1100	8.34794E+16	133.0999561	1.10E-17	3.34E-37	6.5675E-10	18.44140725	1.3695E-22	3.8445E+16	1.10333287	3.8445E+16	0.38444607
1200	6.43004E+16	172.7999378	1.32E-17	3.68E-37	7.877E-10	18.40700406	1.9701E-22	2.7357E+16	1.32333272	2.7357E+16	0.2735688
1300	5.0574E+16	219.6999143	1.56E-17	4.01E-37	9.3056E-10	18.37510006	2.7495E-22	1.9993E+16	1.56333255	1.9993E+16	0.19992921
1400	4.04924E+16	274.3998848	1.82E-17	4.34E-37	1.0853E-09	18.34536048	3.7401E-22	1.4948E+16	1.82333235	1.4948E+16	0.14947983
1500	3.29218E+16	337.4998481	2.10E-17	4.67E-37	1.252E-09	18.31751282	4.977E-22	1.1398E+16	2.10333211	1.1398E+16	0.11398436
1600	2.71267E+16	409.5998034	2.40E-17	5.01E-37	1.4306E-09	18.29133254	6.498E-22	8.8426E+15	2.40333184	8.8426E+15	0.08842577
1700	2.26157E+16	491.2997494	2.72E-17	5.34E-37	1.621E-09	18.2666325	8.3436E-22	6.9645E+15	2.72333153	6.9645E+15	0.06964533
1800	1.9052E+16	583.1996851	3.06E-17	5.67E-37	1.8234E-09	18.24325518	1.0557E-21	5.5596E+15	3.06333119	5.5596E+15	0.05559605
1900	1.61993E+16	685.899609	3.42E-17	6.01E-37	2.0377E-09	18.22106681	1.3184E-21	4.4917E+15	3.4233308	4.4917E+15	0.04491716
2000	1.38889E+16	799.99952	3.80E-17	6.34E-37	2.2639E-09	18.19995281	1.6273E-21	3.6683E+15	3.80333037	3.6683E+15	0.03668336
2100	1.19977E+16	926.0994166	4.20E-17	6.67E-37	2.502E-09	18.17981434	1.9876E-21	3.0253E+15	4.20332989	3.0253E+15	0.0302526
2200	1.04349E+16	1064.799297	4.62E-17	7.01E-37	2.752E-09	18.16056554	2.4047E-21	2.5171E+15	4.62332936	2.5171E+15	0.02517119
2300	9.13217E+15	1216.69916	5.06E-17	7.34E-37	3.0139E-09	18.14213137	2.8842E-21	2.1113E+15	5.06332877	2.1113E+15	0.0211132
2400	8.03755E+15	1382.399005	5.52E-17	7.67E-37	3.2877E-09	18.12444587	3.4321E-21	1.7841E+15	5.52332814	1.7841E+15	0.01784097
2500	7.11111E+15	1562.498828	6.00E-17	8.00E-37	3.5734E-09	18.10745075	4.0545E-21	1.5179E+15	6.00332745	1.5179E+15	0.01517878
2600	6.32175E+15	1757.598629	6.50E-17	8.34E-37	3.871E-09	18.09109427	4.758E-21	1.2995E+15	6.5033267	1.2995E+15	0.01299513
2700	5.64503E+15	1968.298406	7.02E-17	8.67E-37	4.1806E-09	18.07533027	5.5493E-21	1.119E+15	7.02332589	1.119E+15	0.01119039
2800	5.06155E+15	2195.198156	7.56E-17	9.00E-37	4.502E-09	18.06011741	6.4354E-21	9.6883E+14	7.56332501	9.6883E+14	0.00968834
2900	4.55579E+15	2438.897878	8.12E-17	9.34E-37	4.8353E-09	18.04541853	7.4237E-21	8.4301E+14	8.12332407	8.4301E+14	0.00843006
3000	4.11523E+15	2699.99757	8.70E-17	9.67E-37	5.1806E-09	18.03120009	8.5216E-21	7.3696E+14	8.70332306	7.3696E+14	0.00736958
3100	3.72969E+15	2979.097229	9.30E-17	1.00E-36	5.5377E-09	18.01743172	9.7371E-21	6.4707E+14	9.30332198	6.4707E+14	0.00647072
3200	3.39084E+15	3276.796854	9.92E-17	1.03E-36	5.9067E-09	18.00408584	1.1078E-20	5.7048E+14	9.92332083	5.7048E+14	0.00570482
3300	3.09183E+15	3593.696442	1.06E-16	1.07E-36	6.2877E-09	17.99113735	1.2553E-20	5.049E+14	10.5633196	5.049E+14	0.00504896
3400	2.82697E+15	3930.395991	1.12E-16	1.10E-36	6.6806E-09	17.97856327	1.4171E-20	4.4847E+14	11.2233183	4.4847E+14	0.00448469
3500	2.59151E+15	4287.495498	1.19E-16	1.13E-36	7.0853E-09	17.96634261	1.594E-20	3.9971E+14	11.9033169	3.9971E+14	0.0039971
3600	2.3815E+15	4665.594961	1.26E-16	1.17E-36	7.502E-09	17.95445605	1.787E-20	3.574E+14	12.6033154	3.574E+14	0.003574
3700	2.19357E+15	5065.294378	1.33E-16	1.20E-36	7.9306E-09	17.94288583	1.997E-20	3.2054E+14	13.3233139	3.2054E+14	0.00320543
3800	2.02491E+15	5487.193745	1.41E-16	1.23E-36	8.371E-09	17.93161557	2.225E-20	2.8832E+14	14.0633122	2.8832E+14	0.00288318
3900	1.87311E+15	5931.89306	1.48E-16	1.27E-36	8.8234E-09	17.92063013	2.472E-20	2.6004E+14	14.8233105	2.6004E+14	0.00260041
4000	1.73611E+15	6399.99232	1.56E-16	1.30E-36	9.2877E-09	17.90991547	2.739E-20	2.3515E+14	15.6033087	2.3515E+14	0.00235148
4100	1.61215E+15	6892.091523	1.64E-16	1.33E-36	9.7639E-09	17.89945858	3.027E-20	2.1316E+14	16.4033068	2.1316E+14	0.00213164
4200	1.49972E+15	7408.790665	1.72E-16	1.37E-36	1.0252E-08	17.88924736	3.3372E-20	1.9369E+14	17.2233047	1.9369E+14	0.00193689
4300	1.3975E+15	7950.689744	1.81E-16	1.40E-36	1.0752E-08	17.87927054	3.6707E-20	1.7639E+14	18.0633026	1.7639E+14	0.00176389
4400	1.30437E+15	8518.388756	1.89E-16	1.43E-36	1.1264E-08	17.8695176	4.0285E-20	1.6098E+14	18.9233004	1.6098E+14	0.00160978
4500	1.21933E+15	9112.487698	1.98E-16	1.47E-36	1.1788E-08	17.85997873	4.4119E-20	1.4721E+14	19.8032981	1.4721E+14	0.00147213
4600	1.14152E+15	9733.586568	2.07E-16	1.50E-36	1.2323E-08	17.85064473	4.8221E-20	1.3489E+14	20.7032957	1.3489E+14	0.00134889
4700	1.0702E+15	10382.28536	2.16E-16	1.53E-36	1.2871E-08	17.84150701	5.2601E-20	1.2383E+14	21.6232931	1.2383E+14	0.00123828
4800	1.00469E+15	11059.18407	2.26E-16	1.57E-36	1.3431E-08	17.83255747	5.7274E-20	1.1388E+14	22.5632905	1.1388E+14	0.00113878
4900	9.44429E+14	11764.88271	2.35E-16	1.60E-36	1.4002E-08	17.82378853	6.2251E-20	1.0491E+14	23.5232877	1.0491E+14	0.00104907
5000	8.88889E+14	12499.98125	2.45E-16	1.63E-36	1.4585E-08	17.81519304	6.7546E-20	9.6803E+13	24.5032848	9.6803E+13	0.00096803
5100	8.3762E+14	13265.0797	2.55E-16	1.67E-36	1.5181E-08	17.80676429	7.3172E-20	8.9466E+13	25.5032818	8.9466E+13	0.00089466
5200	7.90219E+14	14060.77807	2.65E-16	1.70E-36	1.5788E-08	17.79849592	7.9142E-20	8.2812E+13	26.5232787	8.2812E+13	0.00082812
5300	7.46328E+14	14887.67633	2.76E-16	1.73E-36	1.6407E-08	17.79038196	8.547E-20	7.6765E+13	27.5632754	7.6765E+13	0.00076765

Figure 5: Table 1: a partial list of the table that contains the results

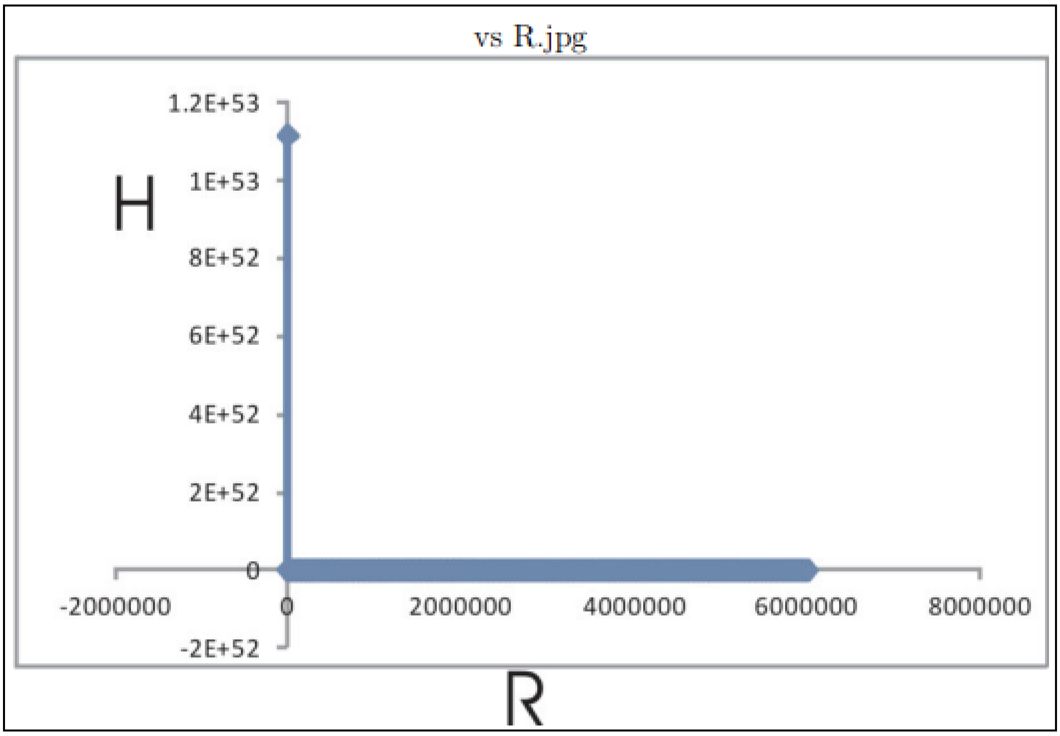


Figure 6: Here you have the evolution of constante H in the expansion of the Universe

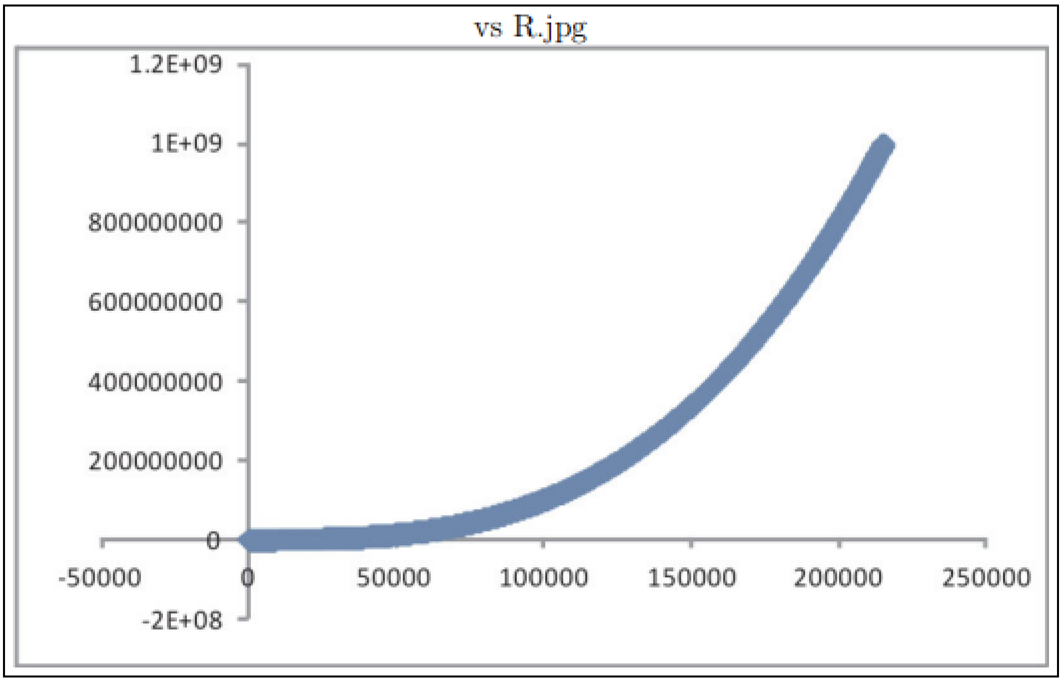


Figure 7: Here you have the evolution of the age of the Universe

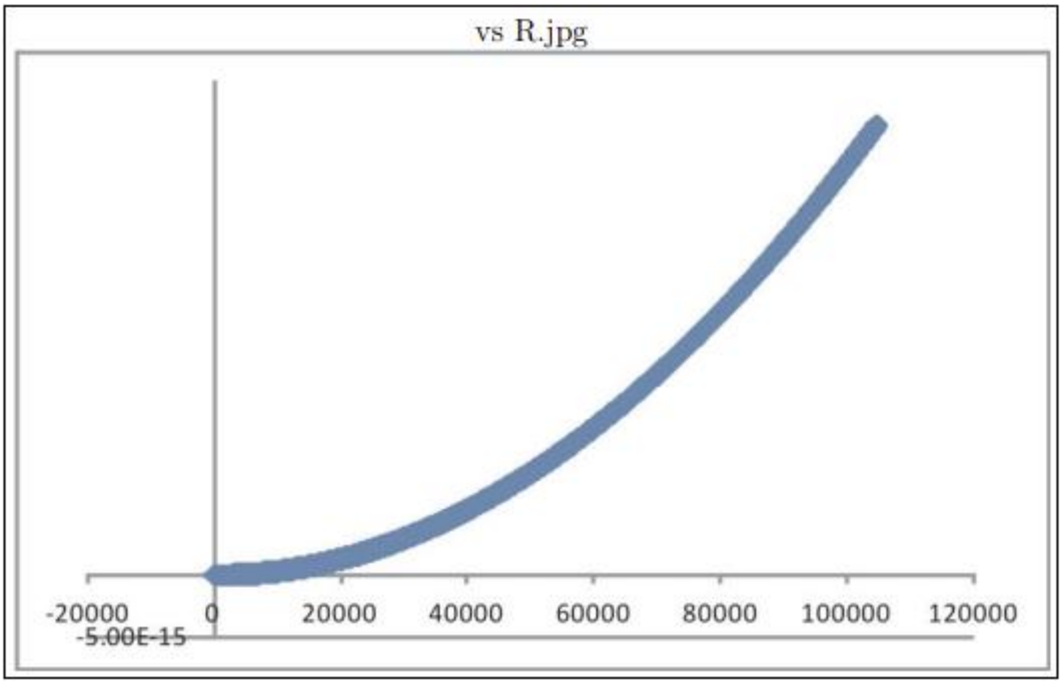


Figure 8: Here you have the mass of the Universe beweenig the expanding Universe

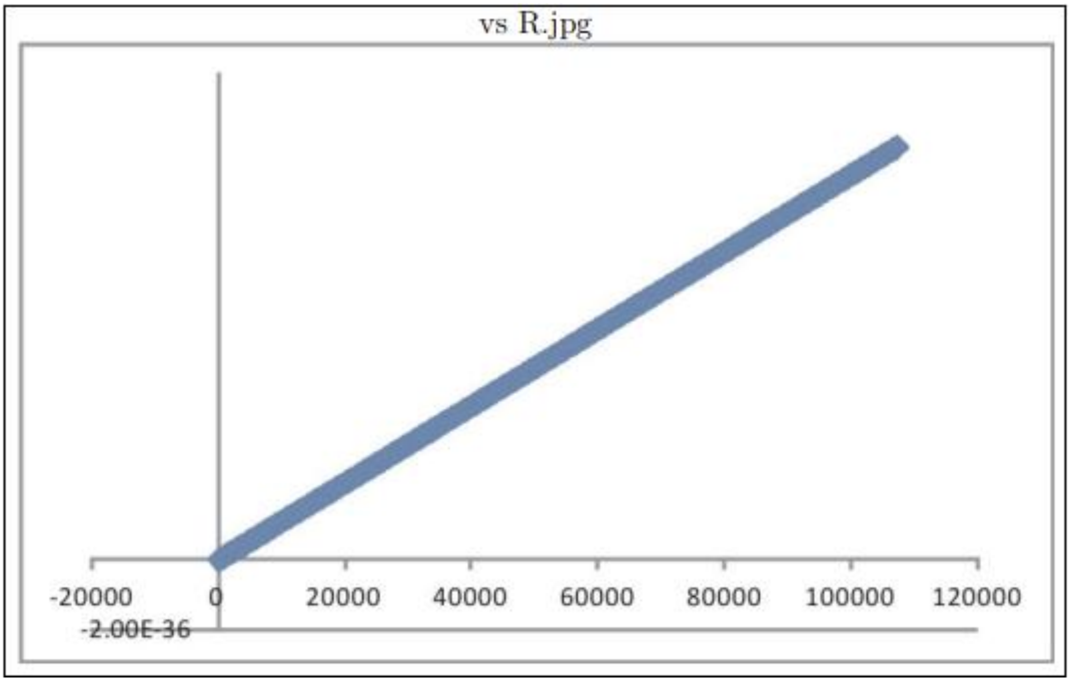


Figure 9: Here you have the density of the Universe during the expantion

to make the Hubble constant the Age and other parameters in function of the distances. We will construct the constant of Hubble and the age of the Universe with the our new law of gravitation. After we integral respect time the second equation, then we have the following

$$\frac{v}{r} = -\frac{GM}{r^3}\left(1 - \frac{GM}{c^2 r}\right)$$

$$Log(H^{-}1) = \text{Log}(r^3.G.M + r^4.G^{-}2.M^{-}2)$$

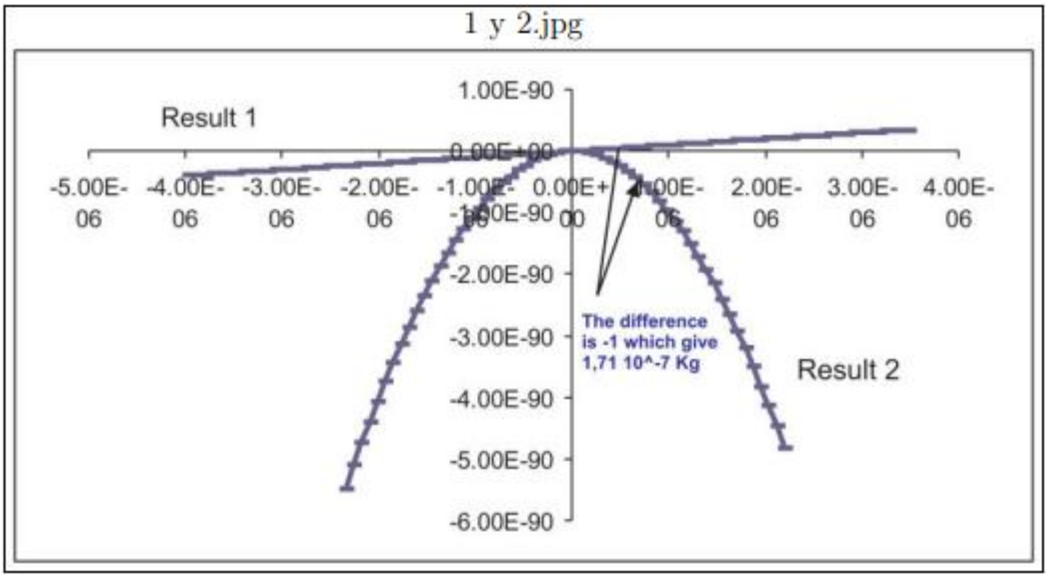
integrating until one in time and derivating the formula we results is

$$H^{-}1 = r^3 \ . \ G \ . \ M \text{ - } (r^4.G^{-}2.M^{-}2)$$

The results are in the Fig 5 and 6. We also know the only parameter of the Universe it is the Hubble constant, with 71*Km/sec/M pc*, we obtained 100*M pc* of radio of the Universe and with this value we obtained the age which is 4500*M y*, almost the half of the knowing age. We doing the calculation of Hubble constant and Age by introducing a mass of $10^{1}7kg$, to obtained low created mass. We are doing the result of the calculation from the following Table 1.

8. Mass is Created in All the Expansion of the Universe

In the beginning the Universe created the mass by the high degree of radiation which allow permit the creation de mass by the impact of two foton (see compare the column 4 which is the created material, with the last one which is the mass which is could be created, Table 1).We have to the mass there are a coefficient between the Age and the radio of the Universe: we have *age/r*, and this we have the mass which is creating. It is the mass in kg which is created by unit of time integrated in the shell. We can demonstrate that the mass is creating by applicant the formula of the Hubble constant. This is like this:



$$-1= G.M.r^{-3} .\ H^{-1}\text{-}\ G^2.M^2 .\ r^{-4} .\ H^{-1}$$

this result for the our time our present radious, at the present time a factor almost same equal of this formula and give a mass of $10^{-7}kg$. It is very important that it is shown in the Figure 10.

It is important that the formula of Hubble constant en la Fig 5 is the mirrow of a Big Bang with inflation, and never can be ignored. If we have for ex- ample that the Universe growing its capacity for the Hubble constant from $10^{+}245$ in $10^{-}153$ second, we could remember the first y the Hubble constant and the second is the time we would be in accordances. The *a/ai*= *e*(Hinf.(*t*- *ti*)), where *Hinf* is the Hubble constant in the inflation, *N* =*Hinf* . (*t*- *ti*) is the number of inflation, which is of accordance with this. We calculated the energy temperature Et the kinecic energy Ek in table 1. The firt it is the cinematic paricutar of the gases

Et = 3/2.*n.R.T* = 3/2.*n.Na.K.T* .

here n el the number of mol which is 1 for the hydrogen and 2 for the he- lio, with 25 percent of helio we obtain 1, 5 for n. The second is the Hubble constant integrated over a shell. Ie the *H* integrated over the all shell.

About integral of the shell but like at the end we compared with the mass per pc^3 that factor is is anulated. After all we have the nuclear energy $En = M.C^2$. We see that the energy of termic and kinematic is in transformation all the amount in mass. The mass derived here is in almost the present mass. If you compared the comuln 4 with the last one we can the little differences between them. The Universe is divided by two parts about the mass is equal to a constant valor, the Universe dominated by radiation, before de 890000 pc, and the Universe dominated by matter, after this. The creation it is show by collision between two foton or by the collision of particules which produces an energetic foton that if is collision with other produce the mass. You can ask you why the temperature so low (see section 9 and 11 below) can created material. This can be understand following the formulas. $E = m.c^2$ and the energy is E = 3/2.*n.Na.k.T* We calculated the number of proton that exist un a cm^3, this value es $10^2$4 proton. If we know the total proton that are in the Universe the radious 10^8.*pc* we see that the total proton is $10^1$02. There exist a 10^{74} proton in stars and galaxies in the Universe, but we do not take into account the interestellar medium and the Dark Mass.

We trated now the non curvature of the Universe, then we calculate this being that the Hubble constant goes to cero when the *r* is infinite, and it is infinite when the *r* is *cero*. Being this aspect to develop a Universe close to the almost constant velocity and can be to *cero* at the infinite. We have a Universe momotonically lower in its velocity until will be cero at the infinite, independently of the density.

9. Temperature

We calculate the temperature of all the mass created in the Universe

We employed the formula of ideal gases.

$P * V = n.R.T$

Edad . r^{-1} . *mass* . *Hubble constant* . *volume* . 12^{-1} . r^{-2} . 0.111

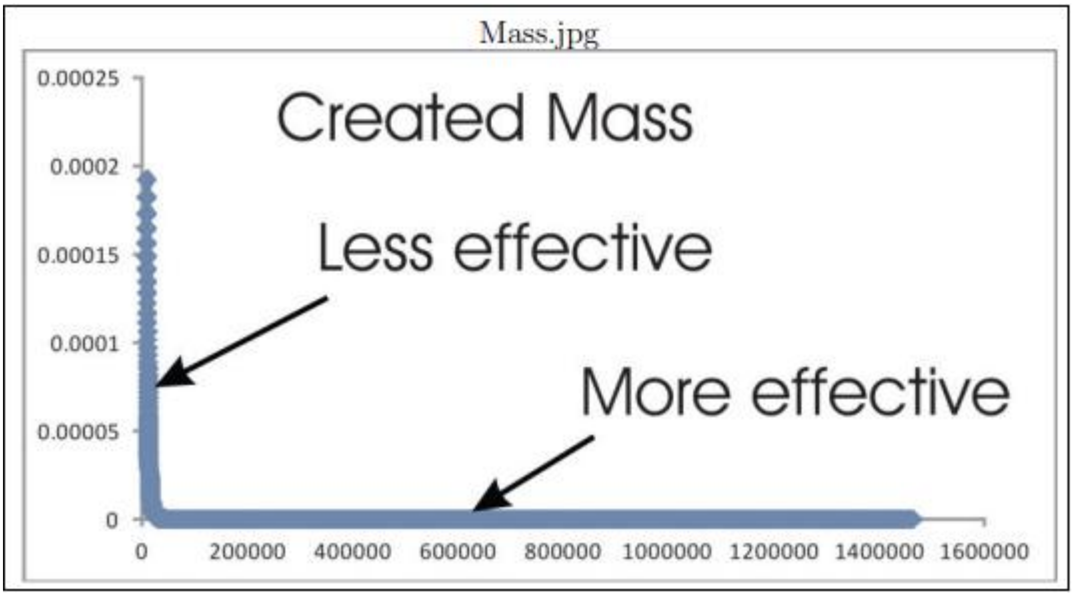


Figure 11: More effective and Less effective created mass

= *n.AvogadroConstant.KtheBoltmanContant.T*

We have the integration by the distances, here we have the rasults:

6. $10^{-}10$. $10^{-}7$. $3^{-}1$. 8.8. $10^{1}7$. 27. $10^{4}8$. $10^{-}44$. 0.111 = 2. 6. $102^{2}6$. 1, 4. $10^{-}23$. *T*

T = 3.13*K*. $10^{8}8$. $10^{-}88$ = 3.13 *K*

We integrate over the time, here we have the results

6. $10^{-}10$. $10^{-}7$. $3^{-}1$. 8.8. $10^{1}7$. 9. $10^{3}2$. $10^{-}44$. 0.111 = 6. $10^{2}6$. 1, 4. $10^{-}23$. *T*

T is equal a $10^{-}16$ and integrating for all the age of the Universe, since 100 second when the Hubble constant is in 8, 8. $10^{+}17$, ie $10^{+}17$ seconds.

T = 2.93 K
It is interesting to note that the temperature de 2.64 K is always to obtain in

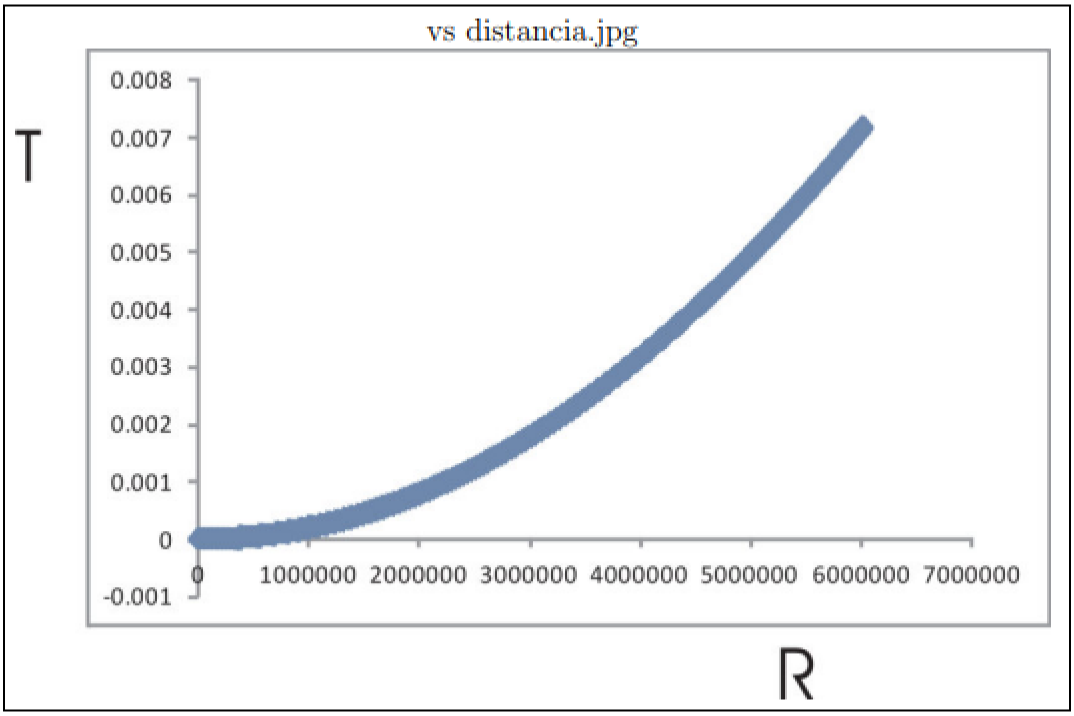


Figure 12: We observe the temperature of the mass of the Universe against the distances

The present time, let me alone the temperature lower for the previous time. This is another prove of the theory because is the temperature that reached in the present time. The theory that a infalling material is the source of the material at 3000*K* close to the beginning of the Universe and the temperature is equal a 3*K* be- cause the expansion is also plausible only is this theory is comparable with the other, the our us, with the temperature also of 3*K*, for all the material created in the expansion, beginning in cero reaching the actual values of almost 3K of our days. Also the anisotropia of the material is also in accor- dance with the formation of galaxies.

To be continued at the end of this article, without reading the paragraph 10 Inflation in all the Shells

10. Inflation in all the Shells

We can take that the model when the mass is created permanentemente, would be full of confiavility in the efficace of inflation, i.e. the inflation would be work in all the place to be confiable. This is because the inflation is and

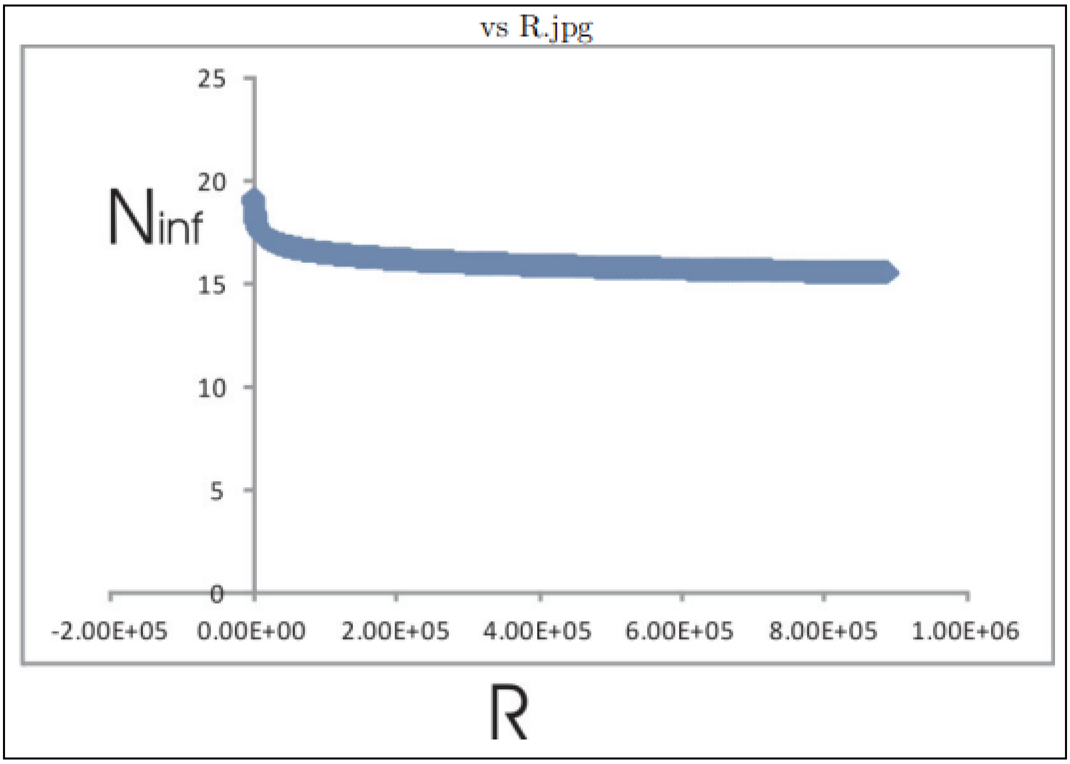


Figure 13: We see the behaviour of the numbre of inflation with the R of the Universe

indispensable additive to the theory and never we can separate of the model. We take a shell at the present time $a/ati = exp(Hinf.(t\ ti))$. If we calculate the engance of the distant to obtain the inflation we can calculate the expansion en the real distance. In table 1 we calculate the number of inflation with this formula, but the t-ti is obtain between one shell in the after the same. The number are logaritmic. This number is in accordance with the expected. With the exception de two value of 67 y 57 all the values ranging between 19 y 15 until the present time. With to compare with the expansion of the Universe during each shell, this is compared with the radios of two contiguous shell. These is a large value to work the inflation, for example in present time we have 15.8 de number of the inflation, where as the expansion of the Universe was of $10^6 pc$. We compare the minimum number of inflation needed to obtain the solve the horizon problem. $Nmin = LOG10(T\ f/T\ r)$, where Tf and Tr are the temperature in the inflacionary form and Tr is the temperature when the Universe is dominated by the radiation. In the begin- ing time we have Tf is the temperature of 10^-6K and Tr is $3000K$. This value we see is the $Nmin$ is 9. At the present time we have an Universe dominated by material is $Nmin = LOG10(T\ f/T\ r^0.5$, Tf is $3K$, where Tr is $3000K$, which we have Nmin is −1.

11. Anisotropies

We calculated the anisotropies doing during before the expansion. We expressed the exponential of the anisotopie with the following formula:

$$D.T = \sum a.K*$$

where $D.T$ is the temperature roule of the anisotropies, a is the coefficiente of anositropies and $K*$ are the spherical coordinates conjungates. In this expresion a are calculate from the formula of

$$\alpha = \int K.D.T$$

doing the fourier formalisims. We expressed the $D.T$ like a numeral form:

$F\ (T) = Na/3PI\ T^-1.5\ n\ m^-0.5.\ s.\ e\ (nsk)$ there the formula is deducted before. Here we trated the s like r^2. sin θ. cos θ.

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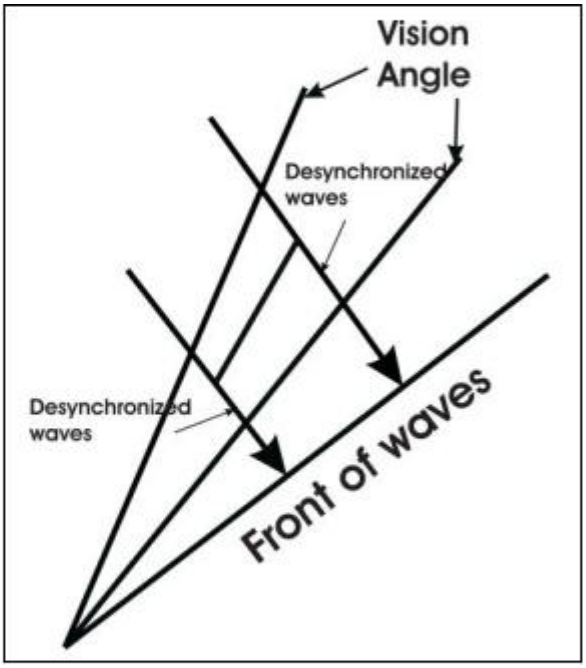

Figure 14: Desincronized waves to see the anysotropies

The figure is one of many formulas with same shell, doing the distances, mass, and the temperature list in the table showing after. For obtain the final formula we have the integration of this formula. Any perturbation about the anisotropies is doing there. For example we treated the fluctuation of the anisotropies like $M = K^n$ following the influential of gravitation affect, doing $n = 1$. In the new formula we admit a new term, it is $M = K^3$. We expressed the anosotropies like admitance of level of the fluctuation causel by the formulas. In the following Figure 17 we treated this sum with different face each, and in Figure 18 we show the differences between the amplitudes.

We develop a diagram to observe the anysotropies. These anysotropies mast be generated by a periodical wave which it arrived. We constructed a angle of vision of these anisoprapies, where in the angle there exist extinction of interestelar material. The anisotropie of cosmic microwave background does not accept this point. In the angle the inferior part is the perturbation less important. In the Figure 14 the result are here. The result say that the inferior angle is result with less important desincronized wave and low temperature and the superior angle the anosotropies are dominated by the

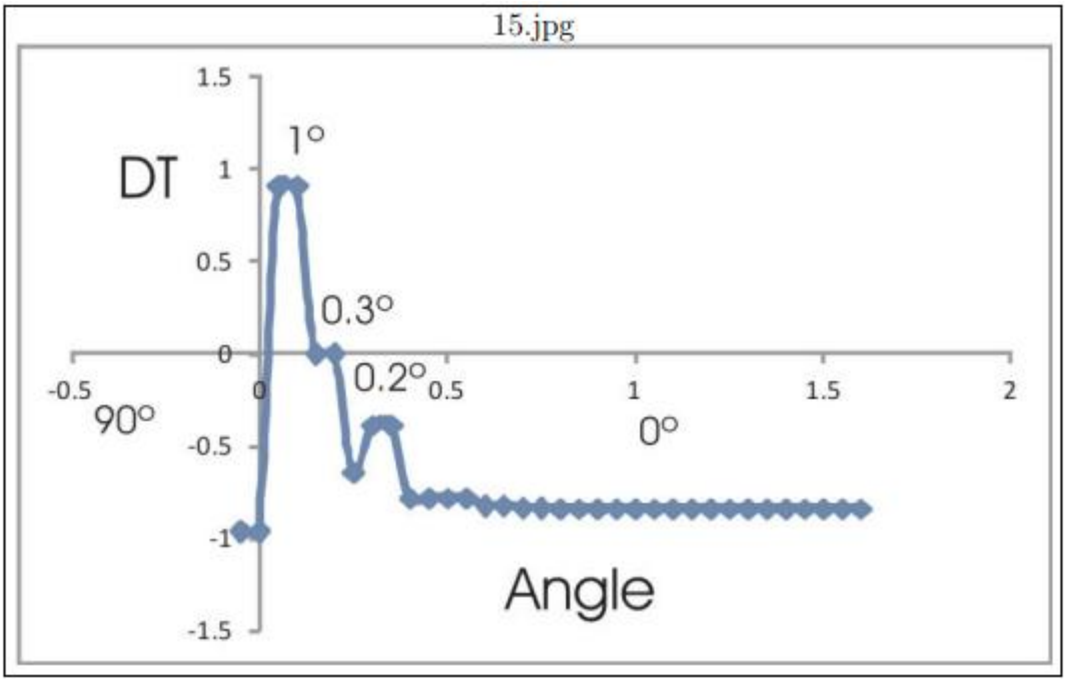

Figure 15: The variation of temperature Dt vs angle. Compare with the observation in Fig 16

extintion. This point is the fundamental for the periodic wave this is arrived: the periodic wave and the extintion of the interestellar background. In Figure 15 we represent the variation the temperature. The principal mode and the secondary mode like its angles are in accordance with the observations. In the Figure 16 we show the observation acquired until today (see Wright 2013). Every perturbatopn produc of a galaxy formation can give this anysotropies. Every periodical wave is different of this process, and the anisotropie like the originated by mirow of the irregular cosmic micrawave background information do not obeid this process.

We assumed the disysncroism is due to by la interestellar medium. We calculate the density of this medium and the temperature. We follow the ideal gases formula. $PV = n.Na.k.T$. P could be separated by the force doing in the wall of the solid angle with unsteroradian de 10. The solid angle is around 1 pc. $gr.cm.s^2.V^2 = .n.Na.k.T$. Divide by el volume we obtain the density. This then given the coefficient of the formula $10^3 2.V^2.n.Na.k.T$. If the volume is 1 pc of the superfece and 1 pc the large we obtain 100mts^2. If we introduce the density of the dar mass $10^{-}29 gr.cm^3$, this thus 10, i.e. this means than the density of interestellar material is less than one percent that density the Dark Mass. To corborate this we calculate the Dark Matter which we obtain in calculate the protons of the Universe. The $10^{2}8$ protons which is the result of anulate the $10^{1}02$ protons minus $10^{7}4$ of the mass in stars and galaxie, we have to multiplic by the mass of a proton this is 10-27. $10^{-}27$ gr, this value is 10-26kg/m^3, which goes to the value of $10^{-}29$ gr/cm^3. If We calculated the infromation that the formula of Fourier analisis account.

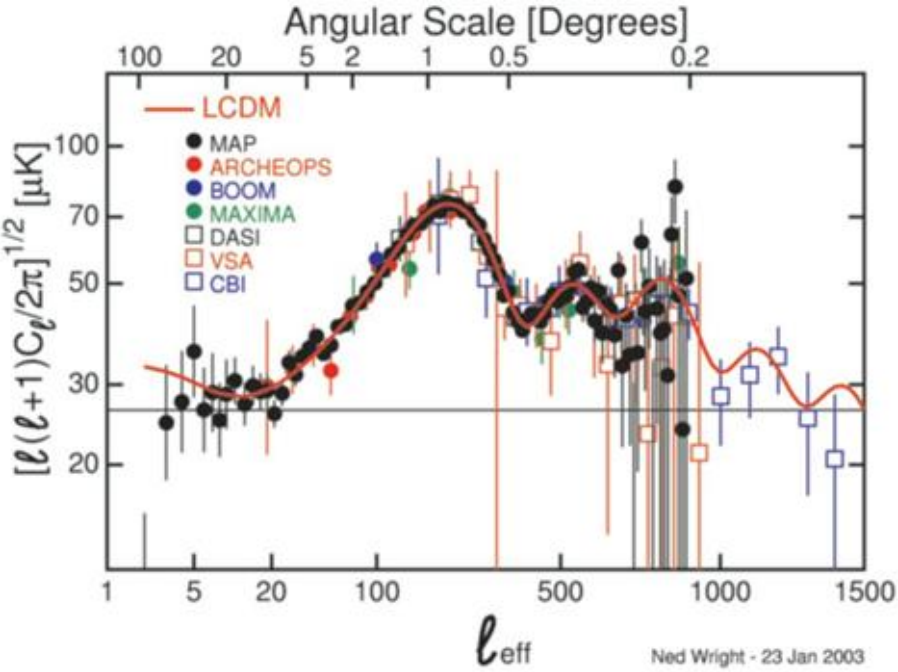

Figure 16: The observation of the anisotropies. Compare with the curve of Fig 15.

We calculate the density of the Universe. We have the following formula:

$F\ (v) = 4PI\ (m/2PIkT\ )^{1}, 5\ .\ v^{2}.\ e^{-}\ (mv^{2}/2kT\ )$

Which is the distribution of velocity between each shell. Kinetic Energy is = 3/2 . *n* . *R* . *T* , being $R = k\ Na$.

Replacing in the equation anterior we have $F\ (T) = Na/3PI$ $T^{-}1.5\ n\ m^{-}0.5.\ s\ e - (nsk)$

F (T)= Na . $3^{-}1$. $T^{-}1.5$. $m^{-}0.5$. s. (e^{-} (Na.s.k))

The results is here
m=$10^{5}4$. Kg

This value can be compared with the calculation of the density being like the common style. We calculate that $10^{-}7$ is the mass created in the shell of radio r and the whide of 1 pc, we will plus the integral over the all the radio of the Universe and we obtain:

m= $10^{-}7$. $10^{1}6$ mts/ 10^{8}. $10^{1}6$. mts = 10 Kg

This is the value to obtain with the constant of gravitation, which give a result of m=$10^{5}7$ Kg

Which a density of
Ω= $10^{-}32$. Kg/mts^3

Which is obtained with the common style
Ω= $10^{-}7$/ 10^{8}. $10^{1}6$. $10^{1}6$

Which give Ω=$10^{-}33$. Kg / mts^3

The Fig 8 does the density growing with the age, which is important that the critical mass density all the Universe is only one and the critical mass density is always the same. It is consequently that the density is the same, because the radio of the Universe is low the density is lower too, and the contrary it is always. Also the density obtained is the close value of the density of the Dark Matter of the Universe. We calculate all the mass of the Universe one calculation with the mass of the Dark Matter. The matter expressed in Table 1, and graphyque in Figure 8, is the matter that expressed also the mass of Dark Matter. All the Dark Matter are also created in all the expansion of the Universe.

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