

The bending of the time under a gravitational field.

José Luís Pereira Rebelo Fernandes

Rebelofernandes@sapo.pt

After the creation of the new theory of universal gravitation, under the paradigm of the radiation of mass and the new theory of relativity, where the space not bend. i go to analyze the bending of the time under a intense gravitational field. One best notion of a black hole.

Introduction:

The new theory of universal gravitation that supports this study comes in annex.

The speeds and the Universal gravitation variable

As already we on the basis of saw and the new theory of relativity, the speed of the light is constant in all the universe, being its value in each different referential, because of its proper bending of the time and exclusively therefore.

That is C happens therefore is this, the escape potential that if finds all in the universe and any local.

Being: $\sum_1^n \left(\frac{Mu_{j-i}}{Re_{j-i}} \right)$ the addition of all the potentials generated in the local i for all the Universal

mass subjects to respective Doppler effect that radiates for the local i

To facilitate the presentation, we go to make to substitute:

$$\sum_1^n \left(\frac{Mu_{j-i}}{Re_{j-i}} \right) = Rad_i$$

Of where we start to have to the escape potential:

$$U_i = 2 G_i \text{ Rad}_i$$

$$G_i = \frac{C^2}{2 \text{ Rad}_i}$$

$$C^2 = 2 G_i \text{ Rad}_i$$

Local we will have to the escape potential:

$$U_o = 2 G_o \text{ Rad}_o$$

$$U_o = C^2$$

When a particle if dislocates to the speed \underline{V} , which is the escape potential that if finds in the particle?

$$U_v = C^2 - V^2$$

If to care of that Rad_i it is constant for the referential in cause, we will have:

$$U_v = 2 G_v \text{ Rad}_o$$

$$\frac{U_o}{U_v} = \frac{2G_o \text{ Rad}_o}{2G_v \text{ Rad}_o} = \frac{C^2}{C^2 - V^2}$$

$$\frac{G_o}{G_v} = \frac{C^2}{C^2 - V^2}$$

$$\frac{G_o}{G_v} = \frac{1}{1 - \frac{V^2}{C^2}}$$

$$\sqrt{\frac{G_o}{G_v}} = \frac{1}{\sqrt{1 - \frac{V^2}{C^2}}}$$

As:

$$\frac{1}{\sqrt{1 - \frac{V^2}{C^2}}} = \frac{t_o}{t_v} = \frac{\sqrt{v}}{\sqrt{o}}$$

$$\sqrt{\frac{G_o}{G_v}} = \frac{t_o}{t_v} = \frac{\sqrt{v}}{\sqrt{o}}$$

Now yes we have something completely new. We are namely as the time if it relates with the gravitation variable. As well as the frequency it also varies with the gravitation variable.

The bending of the time and the gravitational field.

When we are in presence of a local gravitational field, this participates in the pure potential of universal mass, that is part of Rad_o .

This value of Rad_o , is the gotten one to the surface of celestial body.

As the potential to the surface of celestial body it is U_s :

$$U_s = \frac{G_s M_a}{R_a}$$

$$\frac{M_a}{R_a} = \frac{U_s}{G_s} = Rad_s,$$

Then we will have, for the universal pure radiation Rad_u , that to remove the local radiation:

$$Rad_u = Rad_o - Rad_s$$

In one any long-distance place d of the center of celestial body, the existing universal radiation will be:

$$Rad_d = Rad_u + \frac{U_d}{G_o}$$

$$Rad_d = Rad_o - \frac{U_s}{G_o} + \frac{U_d}{G_o}$$

$$Rad_d = \frac{c^2}{2 G_o} - \frac{U_s}{G_o} + \frac{U_d}{G_o}$$

$$G_d = \frac{C^2}{2 Rad_d}$$

$$G_d = \frac{C^2 G_o}{C^2 - 2 (U_s - U_d)}$$

$$\frac{G_d}{G_o} = \frac{C^2}{C^2 - 2 (U_s - U_d)}$$

$$\sqrt{\frac{G_d}{G_o}} = \sqrt{\frac{C^2}{C^2 - 2 (U_s - U_d)}}$$

As:

$$\sqrt{\frac{G_d}{G_o}} = \frac{t_d}{t_o}$$

$$\sqrt{\frac{C^2}{C^2 - 2 (U_s - U_d)}} = \frac{t_d}{t_o} = \frac{\sqrt{o}}{\sqrt{d}}$$

Final condition of the bending of the time and the gravitational field.

Velocity:

$$V_d^2 = U_d$$

$$\frac{G_d}{G_o} = \frac{C^2 - U_d}{C^2}$$

Gravitational potential:

$$\frac{G_d}{G_o} = \frac{C^2}{C^2 - 2 (U_s - U_d)}$$

As:

$$\frac{G_d}{G_o} = \frac{C^2 - U_d}{C^2} \frac{C^2}{C^2 - 2 (U_s - U_d)}$$

$$\frac{G_d}{G_o} = \frac{C^2 - U_d}{C^2 - 2 (U_s - U_d)}$$

$$\sqrt{\frac{G_d}{G_o}} = \sqrt{\frac{C^2 - U_d}{C^2 - 2 (U_s - U_d)}}$$

$$\sqrt{\frac{G_d}{G_o}} = \sqrt{\frac{C^2 - U_d}{C^2 - 2 (U_s - U_d)}} = \frac{t_d}{t_o} = \frac{\sqrt{o}}{\sqrt{d}}$$

Speed of light at local d.

$$C_d = C_o \sqrt{\frac{C^2 - 2 (U_s - U_d)}{C^2 - U_d}}$$

We have now completely defined the equation of the time under the share of a gravitational field.

Generally we have:

$$\frac{G_d}{G_o} = \frac{R_{ado}}{R_{adl}} \frac{C^2 - V_d^2}{C^2}$$

$$\frac{t_d}{t_o} = \sqrt{\frac{G_d}{G_o}} = \sqrt{\frac{R_{ado}}{R_{adl}} \frac{C^2 - V_d^2}{C^2}}$$

The variation of the speed of the light throughout the times

Of the previous considerations, we conclude, that when local the gravitation variable increases the time also it increases:

With growing of the Universe the local gravitation variable, increases in the ratio of the growth of the Universe.

$$\sqrt{\frac{G_{ot}}{G_o}} = \frac{t_{ot}}{t_o}$$

As for all always the relation will be remained:

$$t_o C_o = t_{ot} C_{ot}$$

$$C_{ot} = C_o \frac{t_o}{t_{ot}}$$

$$C_{ot} = C_o \sqrt{\frac{G_o}{G_{ot}}}$$

Taking care of to the one that in the initial phase of the Universe the value of G_{ot} would be very small, at any local the speed of the light in the initial phase it was very bigger of what today.

From there and in accordance with Magueijo (VSL), to accept the beginning of the variable speed of the light, therefore in all the universe, independently of the local, the speed of the light read in the past was very superior that one that if can measure today.

In the same way that we will go to read a lesser speed of the light, all the speeds will also go to be chores in a lesser value.

This phenomenon goes to make with that the translation speeds want of the Hearth want of the Moon go in them to appear slower

Not because these had softened, but yes because our time will go to increase.

The future value of the mass at local.

$$m_{ot} = m_o \sqrt{\frac{G_{ot}}{G_o}}$$

At local the mass increase.

The escape potential, in the observed referential

$$G_v = \frac{c_v^2}{2 \frac{M_v}{R}}$$

$$G_v = \frac{c_o^2 \left(\frac{t_o}{t_v}\right)^2}{2 \frac{M_o \frac{t_v}{t_o}}{R}}$$

$$G_v = G_o \left(\frac{t_o}{t_v}\right)^3$$

$$U_v = 2G_v \frac{M_v}{R}$$

$$U_v = 2G_o \left(\frac{t_o}{t_v}\right)^3 \frac{M_o \frac{t_v}{t_o}}{R}$$

$$U_v = 2G_o \frac{M_o}{R} \left(\frac{t_o}{t_v}\right)^2$$

$$U_v = U_o \left(\frac{t_o}{t_v}\right)^2$$

$$C_v^2 = C_o^2 \left(\frac{t_o}{t_v}\right)^2$$

$$C_v^2 = C_o^2 \left(\frac{t_o}{t_v}\right)^2$$

$$C_v = C_o \frac{t_o}{t_v}$$

$$C_v = \frac{C_o}{\sqrt{1 - \frac{v^2}{c^2}}}$$

Black Holes.

Now that we know the bending of the time under the share of a gravitational field, we are in conditions to analyze what is transferred in a black hole.

$$\frac{t_s}{t_o} = \sqrt{\frac{G_{os}}{G_{oo}}} = \sqrt{\frac{\rho_{oo}}{\rho_{os}} \frac{c^2 - v_s^2}{c^2}}$$

Generically for the unit of unitary time t_o we will have then the potential of escape given for:

Let us consider the black hole as referential. Stopped.

$$\frac{t_s}{t_o} = \sqrt{\frac{G_{os}}{G_{oo}}} = \sqrt{\frac{\rho_{oo}}{\rho_{os}}}$$

The potential energy created by the black hole, taking part in the universal energy density on the site.

.The density of potential energy created by the black hole must be greater than the density of energy generated on site for all other universal mass.

$$\frac{M}{R} = k \rho_{oo} \text{ para } k \geq 1$$

The universal radiation to the surface of the black hole, would start to be:

$$\rho_{os} = (1 + k) \rho_{oo}$$

We would have then in the referential for the black hole:

$$\frac{G_S}{G_O} = \frac{\rho_O}{\rho_S}$$

$$\frac{G_S}{G_O} = \frac{1}{(1+k)}$$

$$\frac{G_O}{G_S} = (1+k)$$

$$\frac{t_O}{t_S} = \sqrt{(1+k)}$$

The speed of light in the frame of the black hole is:

$$C_S = C_O \frac{t_O}{t_S}$$

$$C_S = C_O \sqrt{(1+k)}$$

$$U_{f_S} = U_{f_O} (1+k)$$

In the referential of the black hole, visa of our referential we would have:

From relativity RF

$$G_S = G_O \left(\frac{t_O}{t_S}\right)^3$$

$$\rho_{SS} = \rho_{OS} \frac{t_S}{t_O}$$

$$\rho_{SS} = k \rho_{OO} \frac{t_S}{t_O}$$

$$U_S = 2G_S \rho_{SS}$$

$$U_S = 2G_O \left(\frac{t_O}{t_S}\right)^3 k \rho_{OO} \frac{t_S}{t_O}$$

$$U_S = 2G_O \rho_{OO} \left(\frac{t_O}{t_S}\right)^2 k$$

$$U_s = C_o^2 \left(\frac{t_o}{t_s}\right)^2 k$$

$$C_s^2 = C_s^2 k$$

The black hole, like all other bodies have to be in this universe. By being in this universe it continues to radiate into the universe, that is, continues to cause gravitation.

As seen previously, the universal escape potential never exceeds the square of the speed of light.

$$K = 1$$

Hence we conclude that:

$$\frac{M}{R} = \rho_{oo}$$

Whatever the black hole mass (M), the potential surface of mass, is always equal to the universal potential of the local mass created by all the other universal masses.

The radius of the black hole, adapted to be, so that the potential of the surface mass of the black hole is equal to the remaining potential of mass on the surface created by all other universal mass.

$$R = \frac{M}{\rho_{oo}}$$

The density of potential energy surface of the black hole will always be:

$$\rho_{os} = 2 \rho_{oo}$$

Generically:

$$\frac{M}{R} = \rho_{oo} = \frac{C^2}{2G}$$

$$C^2 = 2G \frac{C^2}{2G}$$

$$C^2 = C^2$$

The size of the radius of the black hole is always so that the energy density generated by it is equal to the potential energy density of all other universal mass at the site.

The black hole is really black, the escape potential is always equal the C^2 ..

The black hole lives in the limit of the potential of C^2 escape, independently of its mass, with $R = \frac{M}{\rho_{00}}$

The maximum potential of escape of a black hole, any that is its relation, $\frac{M}{R} = \rho_{00}$, is always C^2 ., and never superior.

The black hole lives in the limit of no radiation, for what, is enough any small alteration in its balance, to radiate.

The black hole is not a hole. Its mass is invisible, but opaque.

They are in space, as all other universal mass.

Black holes with very high rotational speeds.

A black hole with very high speed, we will find a large flattening of the poles and a weight distribution towards the equator, which will increase the average distance from the circle of radiation and the slope of the potential for escape, allowing the poles the escape potential is less than C^2 .

This is the reason why black holes with great speed pump energy through the poles.

As its radius is limited by the potential energy density universal in local, then all the matter will be expelled for his downed poles.

Experience of confirmation the theory.

When thinking about the future, with the increase of the local gravity, they will appear two different phenomena:

The nuclear radius of the matter, diminishes in the same ratio of the increase of the ray of the Universe.

$$R1 = R0 \frac{T_o}{T_1}$$

$$R1 = R0 \left(\frac{t_o}{t_1} \right)^2$$

On the other hand, with the increase of the local gravity the time goes to increase, for what the speed of the light deals will be lesser:

$$t1 = t0 \sqrt{\frac{G_1}{G_0}}$$

$$C1 = C0 \sqrt{\frac{G_0}{G_1}}$$

$$C1 = C0 \frac{t_o}{t_1}$$

Now let us analyze the time that a blinking will delay to give the return to the Hearth:

$$T0 = \frac{2 \pi R0}{C0}$$

In the future, being:

n - Number of passed years.

Age of universe - 15.197.368.421 a.l

$$T1 = \frac{2 \pi R1}{C1}$$

$$T1 = \frac{2 \pi R0 \left(\frac{t_o}{t_1} \right)^2}{C0 \frac{t_o}{t_1}}$$

$$T1 = \frac{2 \pi R0 \frac{t_o}{t_1}}{C0}$$

$$T1 = T0 \frac{t_o}{t_1}$$

$$T1 = T0 \sqrt{\frac{15.197.368.421}{15.197.368.421+n}}$$

Logically, that the annual variation, will be almost imperceptible.

1 year, 1 return $\partial T = - 0,0044$ nanos.

1 year 1000 returns $\partial T = - 4,4$ nanos.

25 years, 1 return $\partial T = - 0,11$ nanos.

25 years 1000 returns $\partial T = - 110$ nanos.

Either perhaps possible to make the experience

The time at the solar system.

If to take care of, to the Earth rate:

$$Vt = 464.56 \text{ m/s}$$

$$Urt = 215.820 \text{ (m/s)}^2$$

$$B = \frac{1}{1 - \frac{U_{rt}}{c^2}}$$

$$\sqrt{\frac{G_d}{G_o}} = \sqrt{B \frac{c^2 - U_d}{c^2 - 2(U_s - U_d)}} = \frac{t_d}{t_o}$$

In the case of the satellite, Moon.

Usl – Gravitational potential of the Moon.

$$\sqrt{\frac{G_d}{G_o}} = \sqrt{B \frac{c^2 - U_d}{c^2 - 2(U_s - U_d - U_{sl})}} = \frac{t_d}{t_o}$$

Place the surface with	Advance the	Speed of light	Differential C local - C	Modification of the length	Apparent speed of light.	Differential apparent local C - C
------------------------	-------------	----------------	-----------------------------	-------------------------------	-----------------------------	---

rotation Ref: Earth time in Ecuador, h = 0	clock for a day, for the time on Earth nanoseconds		Earth	a)		Earth
		m/s	m/s	Partes	m/s	m/s
Earth	0	299.792.458,40	0,00	0,00000E+00	299.792.458,40	0,00
Space station h=380 km	-24.921	299.792.458,49	0,09	-7,82827E-11	299.792.458,51	0,11
Satellite h=20.200 km	38.552	299.792.458,27	-0,13	-1,05811E-09	299.792.458,58	0,18
Moon	55.998	299.792.458,21	-0,19	-1,30661E-09	299.792.458,60	0,20
Orbit around the Sun h=2.000.000km	-62.457.851	299.792.675,12	216,72	1,45563E-06	299.792.238,73	-219,67
Mercury	-1.974.364	299.792.465,25	6,85	3,00701E-08	299.792.456,24	-2,16
Venus	-484.230	299.792.460,08	1,68	7,40788E-09	299.792.457,86	-0,54
Mars	487.869	299.792.456,71	-1,69	-7,89836E-09	299.792.459,08	0,68

a) - The diameter of the matter varies with the potential of pure mass universal. Not vary with speed. An instrument that is carried to measure the speed of light will also do so. When considering the size it would have on Earth we get the apparent speed of light.

As we will see in the same article, the speed of light on Earth will also vary throughout time. It currently decrease around -0.00986 m/s by year, (-1 m/s in the next 101 years).

If we repeat the experiment in 1978 by the English group, Woods and Others, which concludes that the speed of light would be $299.792.458.8 \pm 0.2 \text{ m / s}$, it appears that the value measured today, 31 years later, varying 0.31 m / s which are already outside the margin of error.

We believe that, given the time elapsed; it should repeat the experiment under the same conditions of 1978.

The experience made in 1987 however, should provide a range of 0.09 m / s, which would still be within the margin of error.

During more detailed analysis made in other articles which give information at the end of the article, other experiments will be proposed.

The future of the speed of light in Earth.

Year	Velocity of light
1978	299.792.458,80
2005	299.792.458,54
2010	299.792.458,49
2030	299.792.458,29
2055	299.792.458,05
2075	299.792.457,86

The value of the Universal gravitation variable in Earth

$$G_t = \frac{c_t^2}{2 \frac{M_{ur_t}}{R_{eu_t}}}$$

$$G_t = \frac{c_t^2 R_{eu_t}}{2 M_{ur_t}}$$

$$G_t = \frac{c_0^2 \left(\frac{t_0}{t_t}\right)^2 R_{eu_0}}{2 M_{ur_0} \frac{t_1}{t_0}}$$

$$G_t = \left(\frac{t_0}{t_t}\right)^3$$

Year	Gravitational variable
1978	6,672600000E-11
2005	6,672600018E-11
2010	6,672600021E-11
2030	6,672600034E-11
2055	6,672600050E-11
2075	6,672600063E-11

The future of the gravity on Earth.

$$g_t = G_t \frac{M_t}{R_t^2}$$

$$g_t = \left(\frac{t_o}{t_t}\right)^3 \frac{M_o \frac{t_t}{t_o}}{(R_o \frac{t_o}{t_t})^2}$$

$$g_t = g_o \left(\frac{t_t}{t_o}\right)^2$$

$$g_t = g_o \frac{T_t}{T_o}$$

The value of gravity on Earth or in any place will increase in proportion to the age of the universe.

Year	Gravity
1978	9,810000000
2005	9,8100000172
2010	9,8100000204
2030	9,8100000331
2055	9,8100000491
2075	9,8100000618

Porto. 27/10/2008

Annex

We go here to make a summary of the new theory of universal gravitation as introduction to the subjects that I will go to treat. All the reasoning had as broken the expression of the gravitational potential:

$$U = \frac{G M}{R}$$

One analyzed which the scientific concepts in cause, concluding itself that the expression $\frac{M}{R}$, it did not correspond to any concept.

After an interpretation of what it would represent the expression, was opted to make to substitute $\frac{M}{R}$, by $\frac{M C^2}{4 \pi R}$ this yes represented the potential of local radiation of the mass.

The expression, thus passed to be

$$U = G_k \frac{M C^2}{4 \pi R}$$

Where G_k would be then the inhibiting factor of the local pure radiation, provoked for the Universal masses/energies. Curious: then my G_k is not more than what the gravitation permeability of the vacuum.

Our expression also can be presented in the form:

$$U = \frac{G_k C^2 M}{4 \pi R}$$

Soon one concludes that the value of G of our initial expression, is not more than what:

$$G = \frac{G_k C^2}{4 \pi}$$

We can now retake the initial expression, therefore already we know which the direction of its terms.

$$U = \frac{G M}{R}$$

Let us now think in Universal terms.

For any place in the universe's radius i:

What is M?

As seen before M will be the mass radiation of any mass in the place j, M_{U_j} .

We speak of mass radiation. But which are its characteristic?

In local gravity we have mass radiation, which despite controlled is the mass radiation.

Is this mass radiation subject to the action of the local gravity?

In order to answer we should look to the black hole. They are masses generator of gravitational field, capable of bending completely their own radiation of light. Although that happens, the black holes besides their own

critical radius, given $(2 G \frac{M}{C^2})$, continue to create a gravitational field therefore **this type of radiation does**

not bend under the action of the local gravity.

We should look a justification for this realization.

The gravity is not capable of bending the mass radiation, therefore it's radiation itself in a straight line way across the whole universe.

Other conclusion we take out of this observation, is the existence of radiation which doesn't bend by action of the gravity, I.e. in its radial spread there will always be radiation perpendicular to the surface of the universe, for which:

If to look at for the beginning, the Big-Bang, then more easily we understand that the Universe grows to the speed of the Light, the energy radiation is radial.

The universe will grow at the speed of light.

As electromagnetic radiation, the mass radiation will be limited also by the limit of the speed of light, condition for the consideration of the Doppler effect.

Being $e_{d_{j-i}}$ the Doppler effect between mass j and the place i.

$$M_{u_{j-i}} = M_{u_j} e_{d_{j-i}}$$

What is R?

R is therefore the radius of emission of the mass radiation j to the universal place i, given the date of emission

$R_{u_{j-i}}$.

$$\frac{M}{R} = \sum 1^n \left(\frac{M_{u_{j-i}}}{R_{e_{j-i}}} \right)$$

$$U_i = G_i \sum_1^n \left(\frac{M_{u_{j-i}}}{R_{e_{j-i}}} \right)$$

Lets, for simplification, replace:

$\sum M_{u_{j-i}}$ – All universal mass subject to its Doppler effect which radiates to the place i.

$$M_{uri} = \sum M_{u_{j-i}}$$

$$R_{eui} = \frac{\sum M_{u_{j-i}}}{\sum_1^n \left(\frac{M_{u_{j-i}}}{R_{e_{j-i}}} \right)}$$

By the equation of the Universal gravitational potential, we will have:

$$U_i = G_i \frac{M_{uri}}{R_{eui}}$$

What is the value of U?

Are we capable to determine which is the mass potential created at the local I by all universal masses?

There is an element that relativity has already clearly characterized as the limit speed of this universe, the speed of light, C .

If the maximum velocity permitted in the Universe is C , then it's that same escape speed in any particular point of the Universe.

$$C^2 = 2 G_i \frac{M_{uri}}{R_{eui}}$$

$$G_i \frac{M_{uri}}{R_{eui}} = \frac{C^2}{2}$$

The universal gravitational potential created in any local point will be given by $\frac{C^2}{2}$.

We now find the homogeneity talked earlier. The basic texture which means the universal space is homogeneity, i.e. the space.

Here is the reason of the non curvature of the mass radiation, because it on its path always finds the same potential in any direction.

In a universe with these absolute homogeneity, locally, it is unthinkable the increase in distance of the celestial bodies, unless it is by the increase of the gravitational variable.

We can now obtain the value for G_i :

$$G_i = \frac{C^2}{2} \frac{R_{eui}}{M_{uri}}$$

$$G_i = \frac{C^2}{2} \frac{1}{\sum_1^n \left(\frac{M_{u_{j-i}}}{R_{e_{j-i}}} \right)}$$

$$G_i = \frac{C^2}{2} \sum_1^n \left(\frac{R_{e_{j-i}}}{M_{u_{j-i}}} \right)$$

We then get the gravitational variable expression in any point of the universe.

We are really before a new paradigm, the gravitation, “gravitational constant”, has a different nature of that we thought.

Because the Universe is in expansion, therefore $R_{e_{j-i}}$ grows, and $M_{u_{j-i}}$ is always constant, then G_i it grows in the same ratio of the growth of the Universe.