

Quasar's Luminosity, the Gravitation Decay and the Galaxy's Time-Clones.

*Described by using
the Nielsen Gravitation theory.*

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Abstract

What is the origin of the high luminosity value of quasars? How old are quasars? In this paper, the Big Bang idea combined with the idea of the expanding universe is used.

We come to the finding that the quasar light must have been circling about the universe several times before reaching us. We find very interesting answers to the quasar problem and to the evolution of the universal gravitation constant. Finally, we predict the observation of galaxy's time-clones: these are simultaneous observations of the same galaxy at different stadia of their development.

The Nielsen theory gives us some tools for these calculations.

Key words : *quasar, gravitation, luminosity, Nielsen.*

Method : *analytic.*

1. The time-dependent dynamics of the universe - (Nielsen Gravitation Theory).

According to the idea of the Big Bang or the expansion theory, it is very reasonable to suggest a variation of G with time, while the other constants remain equal.

To fix some ideas mathematically, the theory of Louis Nielsen for gravitation, which shows an intriguing connection between the elementary particles and the universe itself, is shown as an possible example.

Louis Nielsen found a very credible way to calculate some fundamental relationships between basic cosmic parameters and elementary particle parameters (see: "The Unified Quantum Universe", 2 Jan 2005, at <http://sci.tech-archive.net/pdf/Archive/sci.physics/2005-01/1121.pdf>).

According to Louis Nielsen, in the early epoch of our universe, the gravitation force was very concentrated, much more than today. However, he supposed that all the other parameters remained constant in time.

The value of the universal gravitation constant G_0 at the very beginning equalled, according to his research, to :

$$G_0 = 2.78 \cdot 10^{32} \frac{m^3}{kg \cdot s^2} \quad (1.1)$$

G is time-dependent according to the equation found by Nielsen :

$$G = G_0 \cdot \sqrt[3]{\frac{t_0}{t}} \quad (1.2)$$

wherein $t_0 = 4.6 \cdot 10^{-111}$ sec is a elementary unit of time according (1.3.a)

Nielsen and t is the variable time.

The time $t = r/c$ where r is the universe's radius. (1.3.b)

The quantum time according to Nielsen is $t_0 = r_0/c$. (1.3.c)

2. The radius of the universe and the age of quasars.

2.1. The universe is expanding and the universe's light is spiralling.

Out of the work of Nielsen, we know that the universal gravitation constant decreased with time, causing the expansion of the universe. The decrease is given by :

$$G = G_0 \sqrt[3]{\frac{r_0}{r}} \quad (2.1)$$

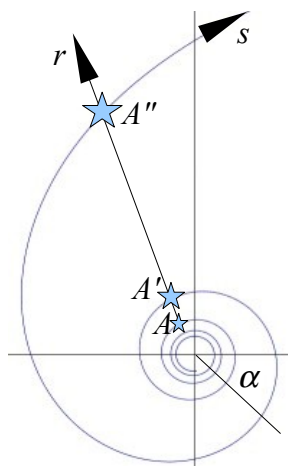


Fig. 2.1

where r stands here for the radius of the universe at a certain moment, as shown in equation (1.2).

The path s of the light however is not the same value. We should see this parameter as the path length of the light since it has left the quasar.

The light of quasars is very strongly redshifted. Why? One of the possible explanations among others can be the following.

In the Big Bang / expanding universe - idea, we should notice that quasars were created at an early stage after the birth of the universe. The high mass density of these quasars and the extremely high value of the universal gravitation constant G at that time are the cause that light from the quasars could be strongly bent by that restricted universe, populated by quasars.

It might be possible that the light was so strongly bent that it circled around the early universe once or even more times before the universe slowly grew in size and before the light reached us.

The expanding universe shows a path-increase of the light source due to circling light.

When light has been sent at a moment A (see fig. 2.1), the universe was smaller than when the light arrived at A' after having circled once about the universe. The same is valid for A'' : the universe inflated until a larger one when the light finally arrived at A'' . Remark that the points A , A' and A'' represent the same point in space at different moments. Relatively speaking, these points are identical in relation to the other items of the universe, but the scale factor makes the difference over time.

Between brackets

The time-dependent scale factor a , related to the Hubble constant is defined by $r = a(t) \cdot x$, where x is the static, non-expanded length and r is the real radius of the universe due to expansion.

The universe expands with the scale factor a , and the Hubble constant is given by : $H = \dot{a}/a$. (2.2)

We find the Hubble constant according the Nielsen theory as follows :

$$H = \frac{\dot{a}}{a} = \frac{\dot{r}}{r} = \frac{d(N^3)}{N^3 dt} = \frac{3 dN}{N dt} = \frac{3 d(G^{-1})}{G^{-1} dt} = 3G \left(\frac{d(G^{-1})}{dt} \right) = - \frac{3 \dot{G}}{G} \quad (2.3.a)$$

According to Nielsen, N gives the present value of the ratio between the electrostatic and the gravito-static forces between a positron and an electron, or between two electrons.

Since $\frac{\dot{G}}{G} = - \frac{1}{3t}$, we got the correct Hubble constant $H = \frac{1}{t} = \frac{c}{r}$ in (2.3) (2.3.b.c)

whereof the inverse gives the age of the universe.

From (2.1), the value for the inflating radius of the universe is then given by : $r = \frac{G_0^3}{G^3} r_0$, (2.4)

what allows us to assume that the time-dependent scale factor a equals to $a = G_0^3 / G^3$. (2.5)

Consequently to the circling of light about the early universe, the journey of quasar light can have been much longer than the straight distance between the quasar and us would suggest.

Observation shows us that a quasar is visually bound with a galaxy, but physically, it should be at a very large distance from that galaxy. Probably, the circling of light about the early quasar explains the optical effect. The quasar and the galaxy are exactly the same objects but photographed at two different moments, after one or more light-circles about the universe!

It is clear from fig.2.1 that the light's path is much longer than the universe's radius, because it circles about the universe's centre. Even the fact that the deep space shows several tiny regions, which can be associated to very early objects of the universe suggests that light doesn't go straight from the universe's centre, but that it travelled another way around before reaching us.

From my paper “[The calculation of the bending of star light grazing the sun.](#)” , equation (2.3) , it follows that the light bends according a force per unit of length : $F = 2GmM/r_g^2$. (2.6.a)

Herein, r_g is the gravitational radius for the given force, M is the total mass of our universe and m the mass of the light per unit of length.

When light travels at the speed c , and the force is perpendicular to the speed, the light motion becomes circular.

Let r_L be the radius of the light, because of the gravitational acceleration a .

Hence, $a = 2GM/r_g^2 = c^2/r_L$ and the radius for circling light is : $r_L = \frac{r_g^2 c^2}{2GM}$. (2.6.b.c)

In fact, the equation (2.6.b) is not complete because we did not take in account the possible rotation of the universe, but this would only complicate it uselessly.

Equation (2.6.c) shows the spiral form of the light, starting at a very small radius when G is large and a larger radius when G is small.

According to Nielsen, M , the total mass of our universe does not change with time, but Nielsen's definition of the universe's mass is the sum of the dark matter and the visible matter.

2.2. The origin of the quasar's luminosity – the age of quasars.

The light of quasars is hundreds or a thousand times larger than that of whole galaxies.

In our theory, we follow the basic idea that, because of the circling of the quasar light about the universe, the final path of the light is much longer than the physical radius of the universe would suggest. Indeed, we suppose that the light that came straight from the quasars without bending, passed along the Earth since long time ago. If not, the expansion of the universe would have been always faster than the speed of light, an idea that which we reject at this moment.

Finally, we assume that quasars are early galaxies themselves, but in a small shape due to the not-yet-expanded universe at that time.

For the actual quasars which are seen in the deep space, the luminosity factor n is : $10^2 < n < 10^3$. This means that the quasar's light circled n times about the universe and cumulated the light before it reached us. It also means that before the n times, there was -by definition- no light of any importance, so we can assume that the quasar was born at that time.

3. Discussion and conclusions

In this paper we could demonstrate the useful application of the Nielsen gravitation theory for the understanding of the luminosity of the quasars. The origin of the quasar luminosity is found in the bending of light by the universe in a spiralling circling, from the light's origin until now. Finally, we deduced the age of the quasars that are visible and that are supposed to be the early stage of the galaxies of today.

Since we see circling light from the quasar and we see the connected galaxy (which is the same object), we also should see the direct (and not bent) light from the same galaxy. This latter galaxy should be in a later stage than the one which is connected to the quasar, because its light goes straight instead of spirally. Moreover, this galaxy should be situated more or less perpendicularly upon the optical trajectory to the quasar and its bound galaxy, due to the circular path of the quasar light. Thus, we should see (at least) three copies of the same galaxy : the quasar, the bound galaxy (once or more times) and the perpendicular galaxy. Only the latter galaxy will be more or less directed in the direction where it is in reality. The others are optically at about 90° .

The orientation of several of these unbound galaxy-clones should help us indicating the direction of the universe's centre.

4. References

1. L. Nielsen: "Quantum Cosmology with Decreasing Gravity. Unification of Micro- and Macrococosmos." <http://www.rostra.dk/louis/>
2. L. Nielsen: "Physical Consequences of Decreasing Gravity." <http://www.rostra.dk/louis/>
3. Lyndon Ashmore : "Recoil Interaction Between Photons and The Electrons In The Plasma Of Intergalactic Space Leading To The Hubble Constant And CMB", March 2003. <http://www.lyndonashmore.com/>
4. Gordon T. Richards et al. : "The SDSS Quasar Survey: Quasar Luminosity Function from Data Release Three.", 2006, arXiv:astro-ph/0601434v2.