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Consideration of Starlight Waves Redshift as Produced by Friction of These Waves on Its Way through Space

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***Abstract*—**In 1929, a light redshift was discovered in distant galaxies and was interpreted as produced by galaxies moving away from each other at high speed. This interpretation led to the consideration of a new source of energy, which was called Dark Energy. Redshift is a loss of light wave frequency produced by galaxies moving away at high speed, but the loss of frequency can also be produced by the friction of light waves on their way to Earth. This friction is impossible because outer space is empty, but if it were not empty and a medium existed in this empty space, then friction would be possible. The consequences would be extraordinary because Universe acceleration and Dark Energy would be in doubt. This article presents evidence that empty space is actually a medium occupied by different particles, among them the most significant would be Graviton or Higgs Boson. If gravity is produced by Higgs Boson particle according to Standard Model and gravity affects empty space, then Vacuum space is full of Higgs bosons.

***Keywords*—**Big Bang, dark energy, doppler effect, redshift, starlight frequency reduction, universe acceleration.

I. Introduction

THE existing matter in the universe can be differentiated into three parts:

1. Stars and galaxies we observe in the sky, according to astronomers would only account for 5%
2. Dark Matter[1] accounts for 27% of the total matter in the Universe [1].
3. Dark Energy, account for; 68%,

Dark Energy is a mystery that could be solved by understanding that light waves lose frequency due to friction.

II. Colors

Each color emits waves with a certain frequency.

The light waves in the upper yellow box reach us more frequently than the red waves that reach us more widely spaced in time (less frequently).

Fig. 1 Yellow color waves [10]

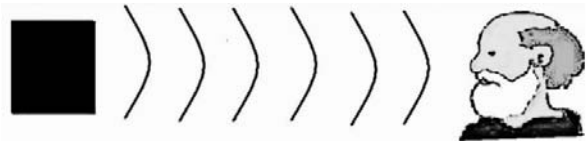

Fig. 2 Red color waves [10]

Fig. 3 Observation of a nearby star [10]

Fig. 4 Observation of a distant start [10]

In 1929, [2] Edwin Hubble, the American astronomer who gave the space telescope its name, observed distant stars and galaxies from the Mount Wilson telescope and realized that their light, instead of yellow or white, came in a more reddish hue. In other words, their waves arrived with less frequency than they should carry.

He come to the conclusion that this change in color and frequency occurred because the galaxies were moving away from us at great speed and consequently of the speed of light of the galaxies directed to us, we had to subtract the speed at which the galaxies are moving away in the opposite direction. In this subtraction was where the waves lost the frequency that they should initially have and that is why they arrived with that reddish hue. This reddish hue is produced by Doppler Effect [4] (A change in the frequency of a wave in relation to an observer who is moving relative to the source of the wave). The entire Universe was expanding at great speed, it is as if we were inflating a balloon.

If we project the film about the expansion of the Universe in

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[1]Fritz Zwicky was the first to suggest the presence of invisible matter (Dark Matter) between galaxies, following his observations at the Mount Wilson Observatory, locating seven cases in the Coma cluster, but he could not convince his colleagues about the importance of his discovery, which remained forgotten for almost forty years

reverse, we will find an initial moment of that expansion, which would be the great explosion or Big Bang. On the other hand, the more distant the galaxies were; the more its red-shifted waves arrived, however, in nearby galaxies, there was hardly a redshift; it seemed that the galaxies not only are moving away from each other but are accelerating their speed along the way. But for there to be acceleration, the initial inertia of the Big Bang is not enough; we need something to hit the gas. That fuel needed to accelerate is what we call Dark Energy.

According to [4]. Einstein's Theory of Relativity, energy is equivalent to mass $E = m C^2$, or in other words, mass is the fuel we need for the Universe to expand rapidly.

For accelerated expansion to take place, a mass-energy is necessary; or matter in the Universe much higher than what we observe with the naked eye, we would need a matter-energy that would account for 68 % of the total matter in the Universe. This 68% of matter-energy is called Dark Energy and the fact that it is invisible and we do not know where it is; is one of the great enigmas of astrophysics

III. Higgs Boson & Graviton

There is an explanation to the Enigma of Dark Energy: and it would come from the hand of what in physics we call "Standard Model": which affirms the existence of a tiny particle that carries gravity and that today we call the Higgs Boson [5]. The entire Universe would be full of these Higgs Bosons, since the force of gravity is manifested throughout them.

In the vicinity of Black Holes, there would be a large number of Higgs Bosons, and in empty space, there would be a minimal number of these Higgs Bosons. The Higgs Boson would be present as a blanket that would cover the entire Universe.

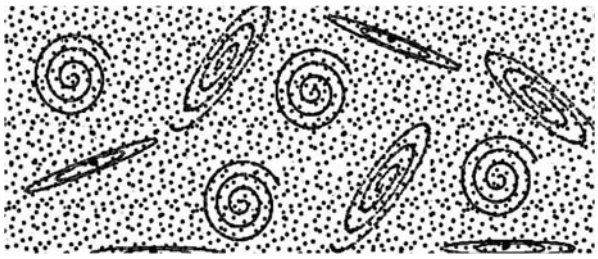

Fig. 5 Higgs Bosons covering empty space [10]

On Fig. 5, we will represent this blanket that covers the Universe, and the black points would be Higgs Bosons. In the empty space there would therefore be an invisible fog with a low concentration of Higgs bosons.

We must consider light as a wave [6] (Young's experiment) that travels through a medium; in this case we can consider the medium as the Higgs Boson fabric in our known Universe.

IV. Propagation of Light Waves and Loss of Frequency

The disturbance caused by a wave is propagated by collisions of the particles that make up the medium, in this case Higgs Bosons when transmitting their thrust each collides with the neighboring one, in each of these collisions some kinetic energy is lost, and this gradual loss of kinetic energy of the Bosons, ultimately translates into a loss of frequency in the propagation of light waves.

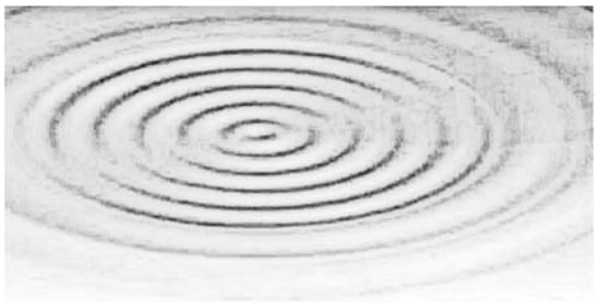

Fig. 6 Water waves [10]

On Fig. 6 we see how the outer water waves that have traveled further are widening and lose frequency with respect to the inner waves. This is a very common phenomenon in nature. Then, light waves would suffer a very slight loss of frequency when propagating through Higgs Bosons medium, but this slight loss of frequency would accumulate over the space of millions of light years, which would gradually slow down the frequency, causing us to observe them redshifted in their spectrum upon reaching Earth.

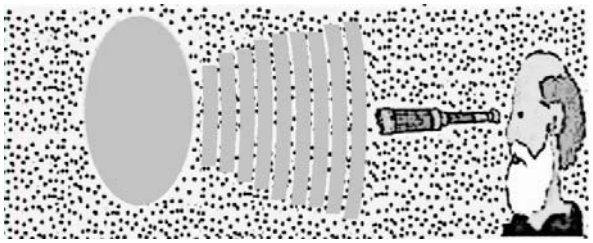

Fig. 7 Close star observation with Higgs Bosons fabric [10]

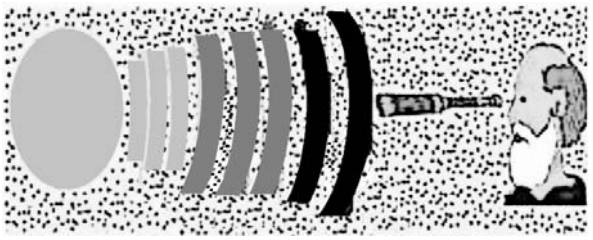

Fig. 8 Distant star observation with Higgs Bosons fabric [10]

Decrease in frequency of light waves would cause them to redshift. An apparent Doppler Effect would occur. This gradual "frequency slowdown" of the waves would explain and constitute the proof why the most distant galaxies apparently move away with greater speed than the closest ones; light waves lose frequency for a longer way until they reach the Earth.

V. Empty Space Medium

A. Light as Particle and Light as Wave

Considering starlight as a particle would not cover all the surrounding space and from a distant planet the star could not

be seen.

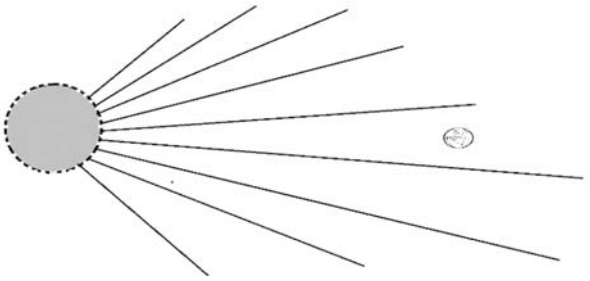

Fig. 9 Light as a particle [10]

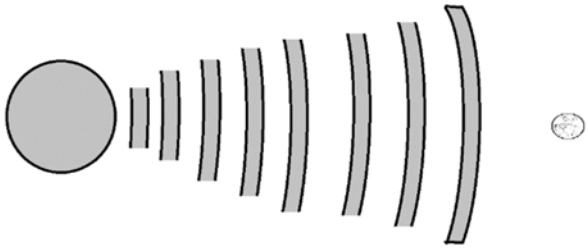

Fig. 10 Light as wave [10]

Consideration of starlight as a wave covers all the surrounding space and from a distant planet the star could be seen.

B. Effect of Gravity on Light

Eddington [7] confirmed that gravity affects the light path, on an expedition to the island of São Tomé, in equatorial Africa, to photograph an eclipse in which it was assumed, that the light from distant stars would bend as it passed close to the Sun.

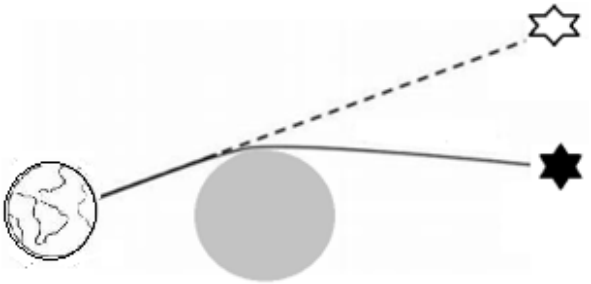

Fig. 11 Starlight bends as it passes near the sun [10]

VI. Big Bang

A. James Webb[2] [8]

Some of the consequences of the Universe expansion, such as the Big Bang, are beginning to be questioned today, especially with the information that comes to us from the James Webb telescope. James Webb telescope has observed Galaxies in deep space, at the origin of the Universe. Galaxies appear perfectly formed and not in formation as should be expected at the origin and near Big Bang.

[2]12-1-2023 The latest James Webb image reveals new clues about the origins of the Universe, as can be seen in Webb's image of the star-forming region known as NGC 346.

B. Acceleration between Galaxies

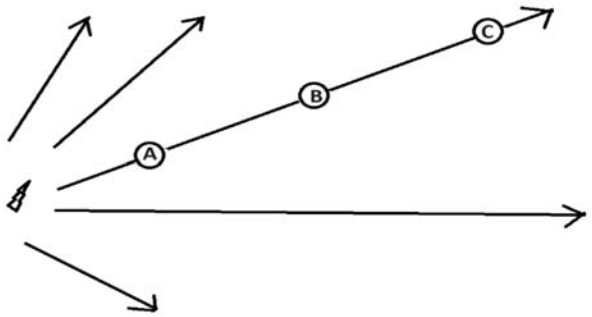

Fig. 12 Acceleration between galaxies [10]

From the redshift of starlight waves, it can be deduced that galaxies move away from each other. Screening the movie of Universe expansion in reverse, the film reaches a starting point called the Big Bang [9], or Big explosion.[3] Starting from the beginning of the Universe with the Big Bang, we could deduce the position of Galaxies on it:

- Let's imagine that the Milky Way is the one marked with the letter B on Fig. 12; by directing our telescope to galaxy A, we should subtract the speed and acceleration of A from the acceleration and speed of B (Earth) and thus we would obtain the acceleration that separates Earth from Galaxy A.
- Directing our telescope to galaxy C we should subtract the speed and acceleration of B (Earth) from the acceleration and speed of C and thus we would obtain the acceleration that separates B (Earth) from C.
- If the distance between A-B is the same as between B-C; the acceleration between B and C should be much higher than between A and B, because greater distance from Big Bang; greater acceleration must be. But the observation of distant Galaxies does not say that, simply; greater the distance from the Earth; greater acceleration.

Experience shows that Universe expansion and Big Bang do not behave as they should. However, the “frequency reduction” proposed in this article would fit with the experience of the Observation of the Universe: "Greater distance, greater redshift" since the starlight on its way to Earth gradually reduces its frequency.

VII. Conclusions

With the explanation of redshift due to friction, the existence of Dark Energy (produced by the distance of the Galaxies) would not be necessary, and therefore it would not be necessary to find the 68% of matter that would imply the existence of Dark Energy. However, it would leave the Big Bang orphaned of its most important test, since the expansion of the Universe would be in doubt.

As there is no accelerated expansion of the Universe, we no longer need the engine of this expansion: Dark Energy. The existence of a static or still Universe would not be proven either,

[3] Big Explosion was first proposed in 1931 by Georges Lemaître when he suggested the universe emerged from a "primeval atom”.

it would simply be necessary to take new measurements.

Ockham's razor tells us that between two possible solutions the simplest is the correct one.

Redshift produced by universe expansion leads us to Dark Energy and to the unknown of where 68% of the matter is in the universe and to the possibility of the existence of repulsive gravity.

The “Waves Frequency Reduction” solution does not require the existence of Dark Energy, nor 68% of matter disappeared in the Universe, nor a repulsive gravity.

REFERENCES

[1] F Zwicky, F.; Herzog, E.; Wild, P. (1961), Caltech, ed., *Catálogo de galaxias y cúmulos de galaxias* 1, Bibcode:1961cgcg.book...Z.
[2] Hubble, Edwin (1929). "A Relation between Distance and Radial Velocity among Extra-Galactic Nebulae". Proceedings of the National Academy of Sciences of the United States of America.
[3] Doppler, Christian (1846). Beiträge zur fixsternenkunde. Vol. 69. Prague: G. Haase Söhne. Bibcode:1846befi.book.
[4] Albert Einstein 26 September 1905 Special relativity paper published on titled "On the Electrodynamics of Moving Bodies”.
[5] Higgs, Peter W. (19 October 1964). "Broken Symmetries and the Masses of Gauge Bosons". *Physical Review Letters*. 13 (16): 508–509. *Bibcode:1964PhRvL..13..508H. doi:10.1103/PhysRevLett.13.508. ISSN 0031-9007*.
[6] Young, Thomas (1 de January 1802). «II. The Bakerian Lecture. On the theory of light and colours». *Philosophical Transactions of the Royal Society of London* 92: 12-48. doi:10.1098/rstl.1802.0004.
[7] A.S. Eddington in March 2019 “The total eclipse of 1919 May 29 and the influence of gravitation on light” in *The Observatory* magazine.
[8] James Webb Image 12-1-2023 image of the star-forming region known as NGC 346.
[9] Georges Lemaître (1946): *L'hypothèse de l'atome primitif* .
[10] Angel Pérez Sanchez (20-8-2020), Book: “Por Fin una Teoría del Todo Razonable” Free License.

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