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Do Black Holes Really Exist?

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Abstract

This article offers a brief critical research of the origins that gave rise to the theory of black holes and the ground on which it is based. The aim is to highlight some contradictions in the interior of the theory itself, which, despite the images recently disclosed of a black hole, could seriously question their existence.

Keywords: Chandrasekhar-limit; General Relativity Theory (GRT); Principle of Exclusion.

Introduction

The ground in which black holes plant their roots is Einstein's General Relativity Theory on one hand and, on the other, W. Pauli's "Principle of exclusion"[1] .

As Stephen Hawking in his book "A brief history of Time"[2] documents, in 1928, on the basis of the two theories/principles mentioned above the physicist S. Chandrasekhar calculated that an exhausted (cold) star whose mass is equal to some more than one and half times that of the sun, would not be able to compensate internally the force of gravity emanating from its mass. For a decade this calculations remained unexplained and ignored. In 1939, Robert Oppenheimer, on ground of Chandrasekhar's calculation, formulated the base of what today is known as the "black holes theory". Only at the end of the sixties of the last century this theory began to be taken seriously.

Discussion

As we know, according to the GRT the sum of speed of the speed of two particles which expand in the opposite direction between them, within the matter, cannot surpass that of light. Besides for the same theory, a curvature of the magnetic fields by gravity is predicted and confirmed.

The principle by which a star remains in equilibrium is founded on the contradiction of two opposing forces. On one hand the gravity exercised by its global mass, which tends to concentrate the star into its nucleus, on the other, the dilatory tendency (Pauli's Principle of Exclusion) which the matter offers in the phase of concentration.

In more explicit terms: the tendency of a star is to concentrate in itself, since the gravity exercised by its mass tends to lead the matter towards a central point.

Yet the same mass, concentrating itself, becomes heated, which means that the internal particles move faster. This increase in speed corresponds to the dilatory thrust that opposes the implosive one exercised by gravity. As long as things evolve at this measure the equilibrium of the star remains stable.

By limiting the sum of speed of two particles to the speed of light, we in fact limit the star's possibilities of expanding in the same measure as it is compressed by effect of gravity. This unbalance, therefore, suggests the fact that the star gradually would begin to implode, concentrating more and more on itself.

In this growing unbalance in relation to the star's forces, a moment arrives when the gravity will be big enough to incurve the magnetic fields transporting light-waves until they reach a stage where they return to the starting point. The characteristic invisibility of the black holes is based on this hypothesis: in practice, they withhold the light – and any others frequency - that they emanate.

Through this process, we can state that a cold star becoming a black hole starts its existence as thus with the mass it originally contains. During the process of implosion, we may even suppose the star loose a deal of its mass. The fact that this mass, at the last stage of concentration, results compressed to a very small volume, does not necessarily means an increasing of the gravity field it produce with regard to other objects around it. In this context we are considering gravity by the side of GRT: the same mass be it in its originally status of balance, be it compressed and concentrated in a very small volume, should generate the same gravity-field. Also admitting that on its very proximity could increase the curvature of the space-time, to such an extent as to retain all kinds of radiation it emits, volume has no part in the gravitational relations between masses, not by Newton's concept of gravity, nor by that of Einstein. It means that whether an exhausted star with a mass of one and half times that of our sun would concentrate itself to a black hole, it won't change anything in the orbital relation with its planets, which will continue to rotate around it, at same distance and the same orbiters as before.

In spite of that, it is presumed that the gravity exercised by the mass of a star became concentrated to a black-hole is such that it violently absorbs matter from other stars in its proximity, even when by "proximity" in this case means distances mostly calculated in light-years. Thereby progressively increasing in proportion: the more matter it absorbs, the more it grows and the more its gravity increases, increasing the capacity to absorb other matter.

Relatively to this aspect , regardless its proportions, since a black hole should contain at its birth the same mass – or some less - as the cold star which in origin changed into it, won't be able to absorb matter from other objects finding themselves at the same distance as before. Therefore it won't be able to grow its mass and we could not explain the X radiations perceived from some part of the Universe as a presence of a voracious black hole. Beside, since it withholds any kind of radiations it emanates, neither would be able to give us any sign of its existence.

Besides: as previously announced, a black hole would already be such, simply because the originating star has reached the maximum limit of speed between particles conceded by GRT in contradiction to Pauli's Principle of Exclusion (Chandrasekhar-limit) [3]. The concept of "explosion" is generally connected to an unexpected expansion of matter caused by sudden overheating. In short, to explode, matter has to violently increase the speed of its particles to obtain the thrust of dilatation necessary to overcome that of gravity. To do this, the particles internally the black hole must surpass the maximum limit, already reached, conceded by GRT which originally was the reason that justified Chandrasekhar's calculations concerning this "limit".

About the recently disclosed images of a black hole

Scientific media have called it almost all "the first photo of a black hole", the "photo of the century" telling enthusiastically the latest scientific result that led, for the first time, to see what's near the event horizon, until the border is drawn. As with almost all the great announcements that find great echo, great echo is also given to the skepticism that accompanies them. There are those who try to dismantle the "media crap" with which the event was inflated, defining it as a "farce", or even coming to question the value of the result itself [4]. Let's try to make things a bit clearer.

What they showed us, in essence, is a map of radio wave emissions from a gas disk that is falling (?) into the event horizon of a black hole. To draw it, however, a color must be assigned: What they did was transform something invisible (the radio waves) into visible. They used colors from red to yellow, a transposition in false colors, like photographing the warmth of a coffee maker, we can detect and produce an image.

What appears in the center of this halo of radio waves is nothing but a dark circle, from which radiations of any kind do not occur. This particular black hole – the only one found between the several million that would exist - given its gigantic dimensions, would be able to bend the magnetic field that carries the radio waves, in its direct proximity, which would be held back and sucked into its internal, without having the possibility of being optically nor in form of radio eaves, perceived up to a distance of over 55 million light years.

On the basis of the premises that form the ground of Black Hole Theory, in the proximity of each of these, all bodies and frequencies - including those of radio - are retained. The peculiarity of black holes would be precisely that of being unperceivable optically, nor through instruments for recording other frequencies. According to this, we should conclude that the optical images produced, computerized and by mass-media disseminated with the claim of a definitive confirmation of the existence of black holes could be of anything except those of a black hole.

About black holes and General Relativity

In principle, all measures are arranged, on a scale of infinite possibilities, from zero to, in fact, infinite. Physics, however makes an exception: the speed. According to the physics that developed following the formulations of Einstein's Special Relativity, speed is to be considered a limited measure which was originally established and confirmed by experimental results.

By a pure mathematical angle, we must consider that the only symbol that expresses an absolute and invariable value is that of infinite, thus, a symbol that can never change adding, detracting or multiply by others numerical values. A symbol that, moreover, could never be translated in a numeric value. The symbol c in facts, as long as it is represented by a letter, contains the same prerogatives as the symbol ∞.

Differently, when translated into a its numerical and measured value it becomes just a portion of infinite, thus an entity that can be changed by interpolating it with other numerical expressions regarding a measure of speed. In conclusion we may say that Einstein's Relativities traits light-speed "c" as "infinite" when is represented by a symbol and as a numerical expression when translated into this latter. In fact, if we relate the symbol c (= constant and invariable) with its own numerical value, using the original Lorentz transformation we will discover that:

$$c = \frac{c}{\sqrt{1 - \frac{(299.792,458)^2}{c^2}}} = \infty$$

Finally, the point that stresses is that the reachable speed limit for non-zero mass particles, which can be close to the numerical value of c, concerns only every single particle and has no relation with the speed of other particles moving in the opposite direction. Therefore, adding the single velocities of two particles moving in the opposite direction to each other is a pure theoretical arbitrariness, which has no counterpart in any objective necessity inherent in the matter. Once again, to postulate the fact that the sum of the velocities of two parts cannot exceed the numeric value of c, we must postulate that c = infinite.

The only part regarding General Relativity, concerning the formulation of the theory of black holes, which has had an experimental confirmation is that concerning the bending of magnetic fields by gravity. This only would be sufficient to explain why a black hole would be invisible but not to sustain how a black hole can come to form. The second one, the one discussed above, regarding the limit 299.792,458Km/s as result of the sum of the velocity of two particles which move in opposite direction, each of them, at a speed close to that , has never had and can never have a mathematical (except considering c = ∞), nor experimental confirmation, therefore the black holes theory is lacking on the elementary bases for the formulation of a serious scientific theory.

Conclusion

Denying or ignoring GRT for the part concerning the speed limit contained in the symbol "c" as the sum of the velocities of two particles, we may suppose, S. Chandrasekhar would have had no reason to perform his calculation which resulted in a limit of expansion regarding the mass's proportions of a cold star, therefore, R. Oppenheimer would have had no reason to theorize the existence of what later has been called black hole.

References

[1] https://en.wikipedia.org/wiki/Pauli_exclusion_principle

[2] Stephen Hawking; "A Brief History Of Time" Chapter 6; pag. 45:

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[3] https://en.wikipedia.org/wiki/Chandrasekhar_limit

[4] https://www.theguardian.com/science/2019/apr/14/the-new-black-hole-what-can-we-really-see