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Gravity Is Not Attraction; It's a Push (Space-Time Expansion Theory)

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Abstract

The space-time expansion has a new perspective on the universe phenomena. In this article, the key features of the Space-Time Expansion Theory are summarized and discussed, with three postulates incorporating different insights into the behavior of space-time expansion, gravity, space-time curvature, and time itself. Gravity is not an attraction; it is a push. Inertia, free fall, the principles of the theory of relativity and some other phenomena support the author's assertions. The expansion of space-time is universal, occurs everywhere, and produces gravity instead of counteracting it. Being immersed in the same space-time acceleration, we only perceive the disturbance caused by the matter, which is the massive objects push. This study aims to offer scientists an alternative investigation. "Gravitation is not attraction; it's a push." All in accordance with hydrodynamic gravitation and expanding Universe.

Keywords

Gravitation, Astrophysics, Cosmology, Space-Time, Cosmos Expansion, Gravity

1. Introduction

Some believe that gravity is not associated with the expansion of the Universe. Their view is that the expansion of space-time is too tiny compared to the magnitudes of the effects of gravity, which is much stronger than the observed expansion since this expansion contributes to only minor scales.

Indeed, according to my calculations at 2.15 Å, there is an expansion of space-time of 3.3×10^{-16} m/sec^2. Our estimates were based on the expansion of the Earth's surface. But due to the broadening of matter, the result is close to the reality observed by cosmologists. This makes it possible to associate the expansion of space-time with gravity.

The effect is manifested immensely increased in the surface of the stellar objects, and then the surface pushes to the surrounding space-time. This accelerated broadening is gravity.

According to our theory, there is no problem in theoretical physics—Lambda—when considering the broadening impact of the primary expansion on the matter.

The energy of the vacuum is driving the acceleration of the Universe. The quantum fluctuations in empty space contribute to vacuum energy, making the cosmological constant non-zero, which is insignificant compared to the magnitudes of gravitational scales due to the broadening of matter in massive objects begin to indicate that they are scalar significant (Steven, 1989).

Physicists have postulated the existence of a yet unconfirmed dark energy, which appears as a cosmological constant in gravitational models, to explain this accelerated expansion (Peebles & Ratra, 2003).

The expansion of space-time produces a slight broadening of the atoms of matter. Thus, matter expands by the superposition of atoms (molecules). The accelerated expansion increases proportionally to the number of atoms that radially constitute matter. However, all this is relative to the general expansion; everything refers to the same time (dt^2), which also expands in an accelerated form.

The velocity in the expansion phenomenon breaks with the mathematical and physical perspective. Special relativity was published in 1905 and explains how motion and speed are always relative to the observer's frame of reference. The theory connects measurements of the same physical incident as seen from different points in a way that depends on the relative velocity of the observers.

On the way to successfully formulating a theory of relativity applicable to relative velocities, our approach is a natural and logical extension of Einstein's theory of relativity. This can be achieved, as well as how the equations of motion might operate in such regimes.

The acceleration that we feel at the Earth's surface is permanent, but the speed associated (ds/dt) is immersed in the accelerated expansion of space-time; the time base is the same as the acceleration of the primary expansion (d^2s/dt^2).

Otherwise, in a short time, we would be reaching the speed of light which remains our existential reference coming from the omnipresent energy that pervades everything, a non-local/non-analytical energy of purely quantum origin.

The broadening effect caused by the expansion of matter practically disappears at four radii from its spherical center. As a result, the thrust that displaces space-time decreases rapidly.

The expansive gravitational push is only significant near the mass that generates it; at three radii from any stellar object, it is only 6.25% that of its surface. In the immensity of space, it is practically impossible to observe it, even less so when immersed in this expansion.

This broadening is perceived as a permanent local effect. We do not perceive any change, as we can observe in the following **Figure 1** courtesy of NASA (JWST, https://webb.nasa.gov/content/about/orbit.html).

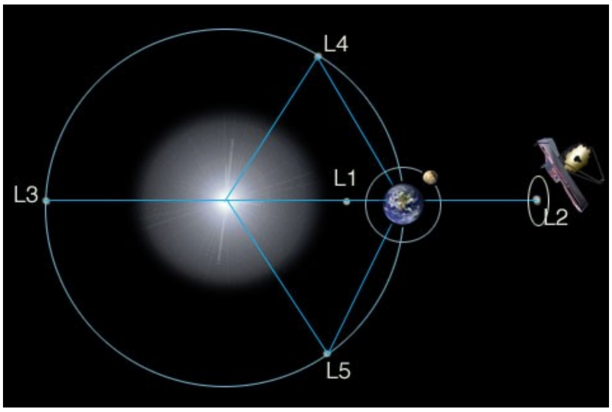

Figure 1. Orbit—Webb/NASA/Lagrange Points.

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The expansive gravitational push is only significant near the mass that generates it; at three radii from any stellar object, it is only 6.25% that of its surface. In the immensity of space, it is practically impossible to observe it, even less so when immersed in this expansion.

This Space-Time Expansion Theory is based on the hypothesis that expansion occurs not only in distant galaxies, but throughout space-time.

Postulate 1

The universal accelerated expansion of space-time permanently expands every element of matter. By atomic-molecular superposition, matter expands, and the object's volume increases relativity.

Postulate 2

The matter expansion is more accelerated toward the object's surface, and its mass pushes the adjacent outer space-time around it, producing the space-time curvature.

Postulate 3

Space-time emerges with its continuous expansion in a continuous present time throughout the Universe. As space expands, new time appears.

The principle of equivalence is the equivalence between gravitational and inertial mass. This principle served Albert Einstein as a starting point for developing his theory of relativity. Likewise, this gravitational proposal uses the equivalence principle not as an equivalence but as gravity itself. Instead of an attraction force, gravity is an accelerated push.

Oriented with Einstein's relativistic laws (Einstein & Lawson, 2001), this gravitational study considers that the gravitational pulling force does not exist; instead of being of attraction force by which things are pulled towards each other, gravity is a push caused by the space-time expansion to matter.

Space-time must be analyzed by means of fluid dynamics, a classical point of view that simplifies its understanding because it is a kind of fluid (Stephani et al., 2003).

To consider space-time as a fluid pushed not only by the gravitational effect of stellar objects but also by their kinetic energy motion facilitates the knowledge of geodesic behavior, not only of their elliptical orbital trajectories but also of the geodesic trajectories followed by light due to the contribution of its propagation energy. And it adequately represents all known gravitational phenomena, including the precession of the perihelion of the planet's orbits.

Thanks to my fellow engineer Eduardo Doryan Garrón, former Vice Minister of Science and Technology of Costa Rica (1986-1990), it should be noted here. In a select group, I was invited to visit the Silicon Valley laboratories, where the famous Hubble Space Telescope was in the construction process to put in Earth's orbit. On that same trip, we had the opportunity to visit Stanford University, located in Palo Alto (California), where we met Stephen Hawking himself. Unfortunately, he lived prostrate in a wheelchair because of multiple sclerosis.

2. Description

Matter and the space-time fluid have a particular characteristic that we will highlight in this study: matter has mass, which maintains its stable state of inertia (the property possessed by bodies that oppose a change in their state of rest or motion in which they are). And the space-time, the incompressible fluid of where the energy of expansion emerges, which maintains the expansion, although there is a mass present.

Considering gravitational phenomena as a push leads to a better understanding of general relativity and the curved space-time interpretation, which adequately represents all known gravitational phenomena.

2.1. The Expansion

Astronomers have discovered the expansion of the Universe; this discovery in the 1920s is attributed to the American Edwin Hubble (1889-1953), Georges Lemaitre, Vesto Slipher and Knut Lundmark.

In the Virgo cluster, it is supernovae that have allowed astronomers to discover the universe's accelerating expansion (NASA, 1999).

According to our proposal, we should not think that the expansion occurs not only at what we might call the limit of the Universe, but, expansion occurs at all levels of our space-time.

The Universe has a continuous and permanent accelerated expansion. It is a single universal expansion in space-time. The expansion of the space-time interacts with the matter internally. There is an energy insertion to the internal space-time fluid that produces matter to have a relative broadening.

The Universe's primary expansion is a space-time property that we cannot be noticed because we are immersed in it. It is a generic property of the Universe we inhabit. But we can perceive their effects: The accelerated push caused by matter due to the broadening of massive objects and the push to space-time around the mass of the expanding object.

The accelerating expansion of the Universe has three different forms of behavior:

- (Primary general expansion).
- (Matter broadening).
- (Space-time push).

2.1.1. Primary General Expansion

Edwin Hubble made a revolutionary discovery using the most powerful epoch telescope. He found that the Universe was expanding (Christianson, 1995).

Quantum fluctuations in empty space contribute to a vacuum energy. Space-time fluid is the fabric of the Universe and is continuously filled with energy of purely quantum origin. We have called this accelerated expansion "Primary General Expansion", which does not manifest itself directly. It is the universal expansion of space-time.

The existence of a yet unconfirmed dark energy floods the whole space and produces positive pressure. It is a non-local/non-analytical energy, an omnipresent force that pervades everything. Dark energy is a space property; it was first discovered in 1998. It is a pressure that pushes expansively from every point of the Universe. So far, it has been called dark energy since scientists do not know what it is (Wang, 2021).

"The amount of energy due to quantum fluctuations is enormous. For example, in the Standard Model, the total energy of a cubic meter of space-time fluid (vacuum) is much larger than that of a cubic meter of ordinary matter (Strassler, 2013)." Exploring the nature of dark energy is one of the main reasons NASA is building the Wide Field Infrared Survey Telescope (WFIRST), a space telescope whose measurements will help clarify the enigma of dark energy (Nancy Grace Roman Space Telescope, 2022).

The matter we perceive as solids, liquids, and gases is due to energetic vibrations so fast that we cannot perceive them with our bodily senses. But quantum physics helps us precisely because it deals with particles and energy networks, which opens this different view of reality. Energy is in everything; without energy, nothing could exist (Wilczek, 2001; Mead, 1964).

2.1.2. Matter Broadening

The universal expansion of space-time interacts with matter, producing a broadening of matter. (The matter broadening is the first of its kind in this scheme).

Expansion occurs permanently to all matter in the Universe. From the different expressions of expansion, is the only expansion that is directly manifested. The acceleration of the expansion is a function of the volume and density of matter. The expansive energy of space-time expands the internal space-time of the atoms-molecules that, one after another, increase by superposition as a net response caused by the sum of the push of each individual atom-molecule. The magnitude of this acceleration responds radially according to the density and volume of the encountered mass.

The universal accelerated expansion of space-time includes the atomic substrate. However, this expansion occurs in the internal space-time of the atom. Possibly between the nucleus of the atom and its electrons. In the nucleus, particles are held together by interactions stronger than the expansion energy. As a result, particles with mass do not give rise to the expansion of space-time.

The confining force: the farther apart the particles are, the greater the force of attraction. The strong nuclear force is more intense the further a particle is separated from its center. Particles are never alone; they are always in duos, trios, quartets, and quintets; if you try to unravel a pair, you must put so much energy into the system for it to be able to convert all that energy into mass. The force increases with distance. Gluons accumulate energy when stretched, so much so that a quark/antiquark pair is created from them (Greensite, 2011).

The expansion of space-time interacts permanently with matter, increasing its internal space. So, this inflation increases the matter's volume, the greater the density, the greater its expansion acceleration. This expansion in the matter has a different effect than in fluid-vacuum space since each atom expands, pushing out its neighbor.

Despite being immersed in the expansion, we notice the accelerated broadening of matter, which we perceive as if it were an earthly pull of gravity; however, what makes our weight is inertia by its accelerated upward push.

According to an article published in "Investigación y Ciencia", the Spanish edition of Scientific American. "The universe expands with an acceleration of ten billionths of the acceleration of gravity at the Earth's surface (García-Bellido, 2011)."

The following statement from astrophysical studies, "that the expansion of space-time is too small compared to the magnitudes of the effects of gravity, which is much stronger than the observed expansion since this expansion contributes only at smaller scales", has supported me in pursuing the idea of this article (García-Bellido, 2011; Steven, 1989).

At atomic size, the magnitude of the broadening is minimal. It can be estimated by considering an average radial constant density of the Earth of 5.51 g/cm^3, whose radius is 6371 km and whose acceleration at the surface is 9.8 m/s^2. The average density of the Earth is close to that of the element radium (RA), whose density is 5.5 g/cm^3. As shown in **Figure 2**, the atomic radius of this element is =2.15 Å. (Slater, 1964).

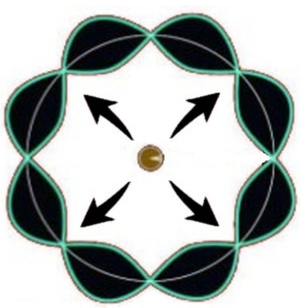

Figure 2. Atoms expand.

I am considering the Van Der Waals radius of an atom which is the radius of an imaginary hard sphere representing the distance of the closest approach for another atom.

Although in other tables, it is mentioned that this radius is 221 pm, in any case, considering their compressibility, this size does not affect our general idea of successive expansion, confirming that the universe is expanding with an acceleration ten billionths of the acceleration of gravity at the surface of the Earth.

This calculation leads to an expansion of 3.3×10^{-16} m/s^2 in this representative atom. Therefore, our assessment does not seem to be far from the reality observed by cosmologists. It is possible that this proposal will help to understand the small-scale problems of dark matter structure formation. NASA Science: "Unfortunately, no one understands why the cosmological constant should even be there, much less why it would have exactly the right value to cause the observed acceleration of the universe." (Li & Rindler-Daller, 2017).

This type of expansion is not like an explosion that has its center. Instead, the expansion of space-time occurs at all points and in all directions. It is everywhere. However, in the matter, the internal space-time of atoms-molecules expands, one after the other, increasing the volume by superposition. That is, the pushes of each individual atom or molecule are added. As a result, a broadening is produced that expands from its center of mass to the object's surface. The broadening is a density function, so we can reasonably analyze the effect at the atomic level. Density describes the degree of bonding between atoms or molecules of a compound. The more the individual particles of matter are bound, the higher the density (more mass). Therefore, the denser the matter, the greater the broadening produced by the accelerated expansion of space-time as shown in **Figure 3**.

If there is no density, the contribution to the broadening produced by the accelerated expansion of space-time is zero since this estimate refers to the expansion of matter, not the expansion of space-time. It should be noted that, at the surface of the earth, where we find light gases, the broadening is almost non-existent.

The broadening has a relation to the volume of the objects, volume increases as it approaches the surface, by superposition as a function of the density of matter. Also, the volume broadening is grater near the Earth surface. Above the surface the acceleration of pushing the space-time fluid decreases with the radius squared.

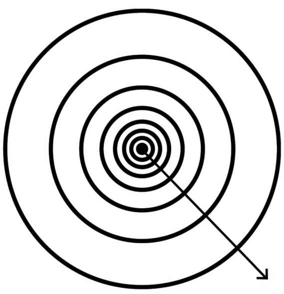

Figure 3. Radially matter broadening.

Being immersed in the same space-time acceleration, we only perceive the disturbance caused by the matter, which is the massive objects push.

2.1.3. Push to Space-Time

The molecules are pushed with the broadening of matter, and the mass of the molecules pushes the space-time on the contour of the spherical surface of the massive body. The mass surface of the accelerating expanding matter ensemble produces a displacement of the space-time fluid by curving it. The accelerated push and the displacement to the space-time fluid occur permanently in real time, and the space-time fluid, which is not compressed, always remains in the primary general expansion.

The broadening of a massive celestial body affects its spherical environment; this has been called the gravitational field. The effect of the matter broadening causes the mass involved in this broadening to push the fluid of the adjacent outer space-time around it. This displacement is distributed in the celestial object's spherical contour zone, and a space-time curvature occurs. The acceleration of the displacement decreases with the radius squared from the center of mass, the gravitational inverse square law to the scales of cosmology (Nave, 2022). The push or displacement is exerted greater on the closer space-time fluid than the farther one.

The effect of this push on distant masses is proportionally different, as is the case with the Moon and the Sun over the tides on Earth.

The push or displacement to space-time is the gravitational field of Newtonian or classical physics. It is only perceptible when an object (mass) is placed in it. Then, in space-time, from the object's frame of reference, it sees the accelerated approach of the massive celestial object. It is an acceleration coordinate system in the radial space-time of the celestial object. Therefore, this displacement by the push to space-time is always permanently present.

The notion of tensor field in relativistic physics must be replaced by that of expansor field in our gravitational conception of push.

The push to space-time is part of the deformation of space-time. The universe's curvature caused by massive bodies determines the trajectory of objects (Davis, 2022). Light path and gravitational lensing identify the curvature produced by this push to space-time. We will see its curved trajectory, although the photons travel in a straight line; this is called a geodesic trajectory. It seems that the space-time fluid is not compressible. When two massive celestial bodies are close to each other, both push the space-time fluid, which accommodates according to the translation velocity of the bodies; this accommodation or space-time fluid currents, produces the geodesics and, therefore, their orbits. That curvature is dynamic; it moves as those objects move: i.e., along with the translational motion of the massive body, the whole push in space-time (gravitational field) also moves with the astronomic body immersed in accelerated expansion. The expansion of space-time broadens matter, but the mass of matter extending displaces space-time by pushing and bending it. This reminds me of the sentence in the classic book named Gravitation Wheeler, J. (Misner, 1973): "Space tells matter how to move; matter tells space how to curve." On the Earth's surface is where space-time is deformed the most. As we move away (the higher we go), the curvature decreases. Curvature is the spherical surface that the sphere has according to how long the radio of the globe is from the center of mass.

The push to space-time produces its curvature, mathematically the surface tends to be a plane as the radio length tends to be infinite.

In general relativity, a geodesic generalizes the notion of "straight line" to curved space-time in the trajectory of, for example, satellites falling continuously around the Earth and planets orbiting the Sun. You can imagine geodesics by integrating translational motion into the expansive medium of space-time (fluid) pushed by accelerating expanding masses.

As shown in **Figure 4**, the far push to space-time produces inertia in the mass of the elements of astronomical bodies, as in the Earth's ocean tides.

Orbital gravity can be considered not a force, but a consequence of a curved space-time geometry in which the source of curvature is the omnipresent "energy-pressure expansor" = "Λ-epe", which can describe the density and flow of energy and momentum in the space-time deformation caused by the pushing of the broadening matter.

The cosmological constant is a macroscopic parameter that controls the Universe's large-scale structure. However, the observations have shown that it is very small, and gravity suggests that the cosmological constant should be very large.

This discrepancy between theoretical expectation and empirical observation constitutes the cosmological constant problem. But considering the matter broadening by space-time primarily expansion small contribution, convert the issue in a physics solution, Einstein's field equations, the term Λ instead of tensors, the name should be replaced by expansors (Stephani et al., 2003).

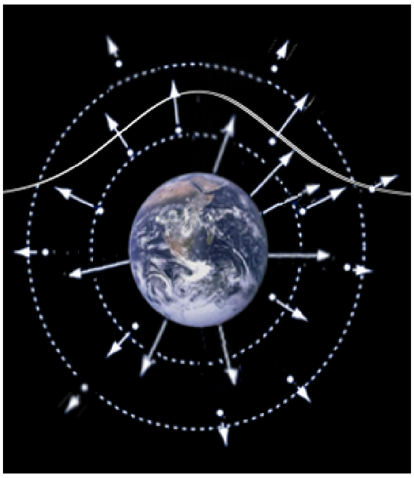

Figure 4. Warping of space-time.

3. Analysis

The accelerated push that bends the space-time fluid around the objects has the same shape permanently. There is a distribution in the surrounding spherical area, so the field shape and radial remaining' acceleration decrease with the radius squared of the centers of the mass.

Mathematically, it would be the same original space-time expansion acceleration in the differential of their farther limit.

The push exerted to space-time by any object in free fall on the Earth is negligible; it is not considered because of its insignificance compared to the push of a massive stellar body, as experienced by Galileo at the Tower of Pisa.

In our accelerated expansive system that displaces space-time, there is velocity if an object is present. This velocity depends on the elapsed time and the initial conditions with respect to the frame of reference that is set. We usually consider the surface of the Earth as the inertial reference frame (Sarikas, 2022).

Space-time expands, not from a particular point, but everywhere and in all directions, including the inner space-time of atoms. The effects of the broadening of matter and the push that bends space-time is what we perceive as expansion. The field decreases with the radius squared, a result that is always present and has the same shape around objects. The final manifestation is minimal because there is a remnant that remains to decrease until reaching Max Planck's dimensions. As the acceleration of the push tends to zero asymptotically, when the volume ratio between space-time and matter is huge, the remanent relative expansion is small.

Since, being a system based on a non-uniformly accelerated expansion, continuous adjustment of the initial conditions must be considered (Singh, 2010). Assuming Gravity as Inertia push, we may have to define the large mass Nebulae, stars, and Black holes' existence and their gravity in new terms. The dark energy concept is based on voids in space but still has some action and our idea of energy conservation. As shown in **Figure 5**, the expansion of the Universe causes force between celestial bodies.

The product of the increase in (surface area = S) times the (acceleration = a) at that radial point is a constant for each object = 4πGM.

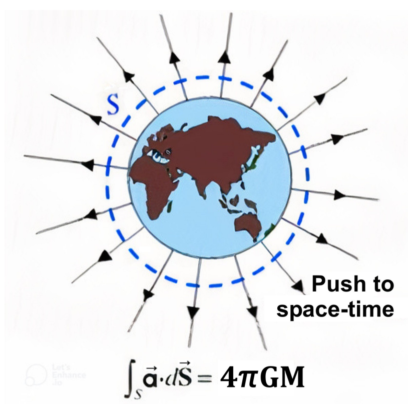

Figure 5. Gauss' law equivalent to expansion.

The acceleration decreases the further away the observer is from the expanding matter. As we move away from the Earth's surface (the height), the acceleration is distributed in the contour of its outer space according to the surface of the concentric sphere, whose radius is the height measured from the center of the Earth. This is known as the inverse square law of distance. The surface area of the sphere increases 4π times $(r + h)^2$, while the acceleration of the expansion decreases $GM/ (r + h)^2$.

We see everything the same since we are immersed in the broadening, which is our reference, that acceleration, that velocity, and that displacement exists in our space-time reference frame.

In the deformation undergone by space-time, displacement = x, velocity = dx/dt and acceleration = d^2x/dt^2 are an exclusive concomitance and interaction of the push to space-time. That is why you don't see alteration, for everything remains the same under our reference frame.

Our expanding gravitational field is only the actual prediction of what will happen when a mass becomes present. In the cases of free fall or orbit, if objects come with a translational velocity or not, what happens in the expanding curved trajectories is that these bodies follow lines that do not affect their stable state of inertia. (Inside a fluid medium with different accelerations).

In all spherical bodies, the effect of the broadening caused by the expansion of matter practically disappears at four radii from its spherical center. We can see from the graph below that the acceleration of the thrust that displaces space-time decreases rapidly. At three Earth radii, it is only 6.25% with respect to the surface.

As shown in **Figure 6**, in the vastness of space, the expansive gravitational push is significant near the mass that generates it, however, the effect of the moon on the tides is noticeable, even though the moon is 60 radii away from the planet, the acceleration of the lunar expansion on the earth being only 0.000033 m/s^2.

The push to space-time reduces its acceleration with the radius squared, the decreasing acceleration in the push to space-time as a function of height soon becomes minimal. Its decrease continues asymptotically to infinity, as a return to its origin: the primary general expansion of space-time.

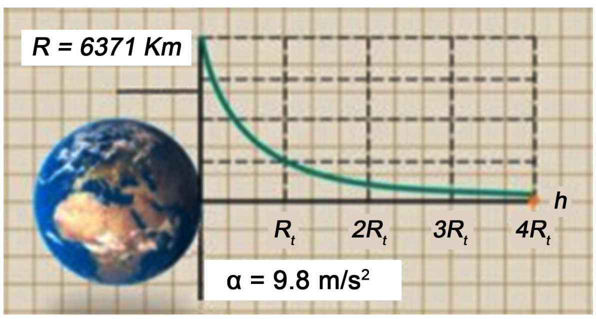

Figure 6. The acceleration of 9.8 m/s^2 decrease rapidly as we move up away.

There is a curved space-time geometry all over Universe due to the push to the space-time of every object with mass, considering Planck's limitation.

The push to space-time is there, but its consequent increase in speed will be noticeable until an object with inertial mass does not want to undergo any acceleration.

The speed is determined under its frame of reference. Therefore, we cannot say that a point on the Earth's surface has a certain speed. There is a well-defined acceleration, but the speed is not determined because it will depend on the observer's frame of reference.

We feel with our weight the maximum acceleration at the Earth's surface but already outside; as we move radially away from the Earth's surface, the acceleration decreases with the radius squared. This would be the case of feeling our weight if we were flying in a balloon or an aircraft. Otherwise, we feel no force at all (free fall) and would only see an approximation of the Earth approaching with that increase in velocity or someone on Earth's surface seeing us falling towards the Earth.

The latter gives us a frame of reference to which we refer to the conceptual ideas. It is the case of the relationship between potential and kinetic energy in free fall, which we can extend to energy exchangers, as is the case with turbines in the water fall. The inertial mass of a body depends on the gravitational potential due to the principle of inertial energy. The acceleration of the falling body is or is not independent of the system's internal energy. It depends on the reference point we use for the analysis.

There is no compressibility in the space-time fluid, so expansion is absolute. The Earth increases in size, but not uniformly. The atomic broadening is the same throughout the internal space of all the atoms. However, the broadening is greater as we get closer to the Earth's surface because there is a superposition increase as a net response caused by the sum of the push of each atom or molecule, thus broadening effect produces a very high pressure near the Earth's center.

According to Minkowski, Einstein's collaborator in developing the theory of relativity, the fourth dimension is time multiplied by the speed of light. $x^2 + y^2 + z^2 + (ct)^2 = \text{CONST}$ Minkowski space-time (Rowe, 2013). Although these coordinates do not apply in accelerated systems, it gives us an idea that the contribution of time is very small.

As the space-time around you is pushed, then you will not be able to measure the increase in the diameter of the earth. But you can see it in distant galaxies.

4. Gravitational Approach

For a long time, it was considered strange that the two different measurements of mass (inertial and gravitational) gave an identical result. It is only now, with this gravitational theory, that it is defined that there is no such gravity; everything is inertia. We have used the word broadening instead of expansion to not confuse the broadening of matter (due to the expansion of space-time) with the expansion of space-time itself. The expansion of space-time is insignificant compared to the broadening of matter of a massive object. When considering the impact of the primary expansion of space-time on the matter, the magnitudes of the broadening show the gravitational scales. To assert the concept of this gravitational idea, I want to conclude by describing again this gravitational approach, according to its common expressions:

1) Weight.
2) Free Fall.
3) Orbital gravity.

4.1. Weight

The weight is the inertia force caused by the rate of change of velocity with respect to time (measurable by an accelerometer) experienced by an object. The equivalence principle states an equivalence between gravitational and inertial mass. This gravitational study incorporates the equivalence principle of Albert Einstein's general relativity, considering that inertial and gravitational mass are the same thing. The surface on which you stand pushes you accelerated upward, radially from the earth's center.

The force of gravity is manifested by the inertia that bodies feel when they are pushed upward at an accelerated rate by the earth's surface.

Some theorists have predicted that new physics might emerge when gravitational experiments are performed with quantum objects such as atoms (Brush, 2010). Likewise, this gravitational proposal uses the equivalence principle not as an equivalence but as gravity itself (Dumé, 2022).

Classical physics says that weight is the gravitational force of attraction acting on the object and can be defined as the product of mass times the acceleration of gravity, w = mg. But weight is an upward push: our proposal defines the weight of an object as the inertial force felt by the object when the accelerated expansion of the massive body pushes it upward. It can be defined as the product of the mass of the object (m) times the acceleration that the surface of the massive body has due to its broadening (a). w = ma.

On the earth's surface, we feel this maximum acceleration with our weight, but outside and as we move radially away from the earth's surface, i.e., the higher we are, the acceleration decreases with the radius squared. In other words, the weight drops when floating in a balloon or flying in an aircraft. On floating just as on the earth's surface, the inertial force of weight appears due to the up push. The metric weight unit in the SI system is the Newton, but it is not a force of attraction; it is a force of push due to acceleration.

Quantum mechanics tries to explain this phenomenon with a particle to be determined called gravitons. Still, our weight and the weight of the objects around us are experienced as a vector quantity: the inertia caused by the acceleration of the upward motion of the earth's surface.

The elements of matter in massive bodies are held together by the inertia caused by the expansion. The pressure caused by the molecules close together successive broadening makes objects spherical. Our weight binds us to the surface of the earth.

Walk and you will feel the upward push!

4.2. Free Fall

Einstein was right: the object in free fall does not experience any force; therefore, it has no acceleration. The expansion of the Earth causes the increased velocity of approaching the Earth; there is no acceleration involved in the object. The principle of equivalence states that the effects of gravity cancel out in a frame of reference in free fall.

About 400 years ago, everyone thought heavy bodies fell faster than light ones. However, such is the difference in mass between any object falling to Earth relative to the mass of the Earth that, in practical physics, it is not included because it is negligible (in our case, the broadening of objects).

Galileo was the first to observe how objects fall towards the Earth (ignoring air resistance). Legend has it that he climbed to the top of the leaning tower of Pisa and simultaneously dropped heavy and light balls, observing that they fell to the ground simultaneously (Adler, 1978).

This test was confirmed again by Commander David Scott when he performed a free-fall demonstration during the Apollo 15 moon landing in 1971, dropping a feather and a hammer from his hands. However, due to the negligible lunar atmosphere, the plume was not pushed up and fell to the lunar soil simultaneously with the hammer.

Galileo's test on the Leaning Tower of Pisa attracted much attention because of the result; however, the trial demonstrated the enormous difference in mass between the objects used in the test concerning the Earth's mass. It is around 20 to 24 orders of magnitude; in such a way, so heavier bodies would fall first than lighter ones insignificantly.

We can assume that without the effect of air resistance, all bodies would fall at the same speed regardless of their weight. However, the earth catches up with objects in free fall because of its broadening. Therefore, objects with mass try not to change their velocity to remain in their stationary state of inertia.

The increase in the volume of any object falling on the Earth is negligible. The push of the Earth over anything falling on the Earth is insignificant compared to the push between massive stellar bodies.

The weight is the rate of velocity change (measurable by an accelerometer) experienced by an object. An observer in free fall is at rest. Therefore, gravitation does not cause it to accelerate and always has zero acceleration.

In free fall, the acceleration is by coordinates. The observer will experience coordinate's acceleration but no acceleration of their own and thus no "g" force.

If you throw a stone, it will fall because of the broadening of the Earth. That is because of the acceleration of the Earth's surface towards the rock. If you throw the stone harder, it will fall farther. If you put a mechanism to help you throw the stone with more force, the stone will fall farther and farther.

Suppose you repeat the experiment but with increasing momentum. In that case, the stone will fall always, but farther and farther, until its fall is so great that it exceeds the curvature of the Earth's sphere.

Thus, the stone will always fall, but it will not touch the surface of the Earth since it will not find it; therefore, it will remain revolving around the Earth. As shown in **Figure 7**, one object orbiting another; falls freely in perpetuity (without considering resistance). This is a satellite.

4.3. Orbital Gravity

Orbital gravity is a geometrical characteristic of space-time. When two objects with a lot of mass are involved, as in the case of the earth and the moon, it is necessary to consider the tangential velocity and its differential radial components to add them to the approach velocities of both massive objects and thus establish their geodesic. All these geodesic trajectories can be analyzed as hydrodynamics because space-time behavior is like fluid within the accelerated expansion of space-time.

To explain this phenomenon, we must consider that there are different types of circumstances according to the amount of object's broadening (matter or mass) have:

1) Large mass difference.

2) Objects with significant masses.

3) Extremely massive objects Such as black holes.

4.3.1. Large Mass Difference

It is the difference in mass between any object falling or orbiting the Earth, such as artificial satellites or objects dropped, which in practical physics does not include the difference in mass because it is negligible compared to that of the Earth. This is the case of the property observed by Galileo that objects of different mass fall with the same velocity (Adler, 1978). (Ignoring air resistance).

Figure 7. The orbit is a form of parabolic fall.

Objects with large difference in mass, as in "free fall", objects in orbit experience no acceleration, a state known as "zero gravity" ("zero-g"), which produces a sensation of weightlessness.

The closer to the surface of massive objects the push is more significant, so the space-time fluid is curved. Making its contribution to geodesic trajectories.

And its small lower effect because of its distance causes the tides on the Earth exerted by the Moon and the Sun by that push.

A body in orbital free fall is a body moving in the presence of an "expanding gravitational field" without any relevant external force acting on it.

Halley comet has a low mass, and we can consider it in the objects with a significant difference in mass. It orbits the Sun every 75 years. So, we humans can have the opportunity to observe it at least once in our lifetime.

Solar wind is a type of solar radiation pressure. It is the proof of our theory. The push from the Sun to space-time causes the tail of ions to be oriented radially away from the Sun. The contribution of light is only partial due to the energy of its propagation and the corresponding refraction. The ions accommodate the different acceleration intensities of the Sun's push to space-time in an expanding accelerated medium as shown in Figure 8.

4.3.2. Objects with Significant Masses

Very massive space objects that have interaction due to their masses, for example, the Moon and the Earth, Jupiter, and the Sun obey a Geodesic path. A geodesic path is a curve representing the shortest distance path (arc) between two points. Every orbit is a geodesic path. The push distribution to space-time and the object's velocity concerning that distribution of space-time fluid makes the geodesic shape for any object moving along. Massive objects travel along a straight line in curved space-time, and geodesic equations can be used in space-time geometry to derive the motion of massive objects and light. The curved space-time geometry is orbital gravity. It is possible to visualize geodesics by integrating the translational motion in the expanding medium of a dynamic fluid pushed by the accelerating expanding masses immersed in wrapped space-time geometry (Santos-Pereira, 2021).

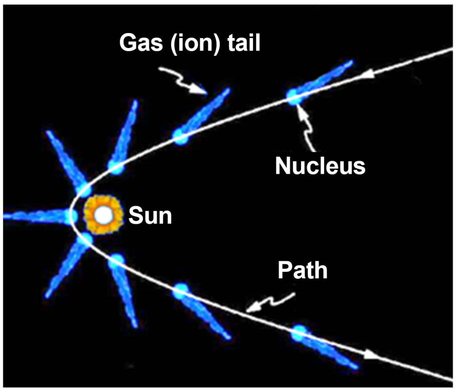

Figure 8. Comet tail displaced by the Sun's push to space-time.

Albert Einstein proposed that massive objects warp and curve the universe, causing other objects to move or orbit along those curves. Curvature is a pathway from our frame of reference. According to our inertial proposal, the gravitational pull shapes the spherical contour of the space around it (Gaussian). The media have tried to explain the phenomenon in two dimensions. Hence the appearance of the spherical cut that represents it to us as a probabilistic bell, also from Gauss, deforming or curving it.

A moving mass does not experience the push of expansion and follows a natural trajectory that we as observers see as a curved space.

n the planetary and other systems, the differential components of the translational velocities of all astronomical objects are incorporated to configure the geodesics of each of them.

It is necessary to consider that weightlessness is of the complete set of the object, the elements with mass that integrate it suffer the own inertial effects of the entity they incorporate.

The gravitational effects are a consequence of the shape of the expanding space-time. The objects move through that curvature without inertial incidence. The geodesic followed by the moving object is a trajectory free of inertial forces at each space-time point of its orbit. It occurs when the perpendicular component of the acceleration, which points to the center of the space-time curvature, is equal to the radial acceleration of the push produced by the massive body. (The most straightforward way to see this complex behavior).

The push to space-time starts from the Earth's surface and begins to decrease, curving the space-time to the same extent. From this, it is easy to understand small satellites where the component of their tangential velocity to the radial one in a differential segment is equal to the approach velocity of the massive object. In this, slight differences make the orbits circular to elliptical. (The circular orbit is a particular case of elliptical orbits).

For example, an inertial body moving along a geodesic through space can follow an orbit around a large gravitational mass without ever experiencing acceleration. Space-time is a non-compressible fluid curved by the push of the close vicinity of large gravitational masses. In such a situation, the geodesic lines bend inward around the center of the masses, and a free-floating (weightless) inertial body will follow those curved geodesics into an elliptical orbit.

The "push to space-time" produced by the Sun and produced by the Earth and the Earth's translation speed causes the Earth to orbit the Sun. The Earth is always in free fall toward the Sun, even though it is moving away towards the aphelion. (Aphelion is the point in the orbit of a planet, asteroid, or comet furthest from the Sun. It is the opposite of perihelion, the point closest to the Sun. The Earth is at aphelion in the first days of July) (Alaeva, 2022).

4.3.3. Black Holes "Super-Black-Expansors"

According to our gravitational proposal, black holes should be called "super-black-expanders" stellar objects since the broadening reaches the light. The space-time in its surroundings caught light till the event horizon.

In black holes, it is not that massless light is attracted but instead trapped. The push on space-time inside the event horizon is greater than the photon energy. As a result, "black holes" flatten the space-time inside them due to the enormous push.

In these stellar objects with a lot of mass, "super-black-expansors" (black holes), whose expansion acceleration tends to infinity, the effect of which would be up to the event horizon, where push has been reduced to the speed of light.

In a black hole there is so much space-time flux on its surface that time stops. $t = 0$.

Then, at the event horizon, we start to see the light that already has space to exist and not be extinguished by not being able to have its electromagnetic wave condition.

Therefore, we could say that the gravitational field directly affects electromagnetism by affecting space-time. However, in the case of black holes, it is erroneous to consider that light is attracted by gravity when in fact, what happens is that light is trapped, and we could still say it is like a path twisted toward the interior of these objects because of their vast expansion.

A black hole is a supermassive celestial body with masses from millions to billions of times that of the sun. They are found at the center of every galaxy in the universe. They maintain the equilibrium of galaxies as the gravitational expansion push maintains our solar system.

When we look at a picture of the Milky Way, we see a spiral galaxy. At the galaxy's center is a massive giant light that many think looks like a supergiant sun. This light does not come from the black hole itself. Recall that light cannot exist in the solid gravitational push of black holes. Instead, the light around black holes is called quasars. Quasars are bright, energetic quasi-stellar objects that surround black holes in the middle of galaxies.

To explain quasars, Stephen Hawking (1942-2018), a theoretical physicist and cosmologist, was at the forefront of the study of black holes and used the laws of quantum mechanics to explore the region near a black hole. As a result, he arrived at the theoretical prediction that black holes emit radiation, now known as Hawking radiation. Hawking said that radiation reduces the mass and energy of black holes; such radiation is also known as black hole evaporation. This substantiates our argument that gravity is a push and not a pull.

According to Stephen Hawking, black holes that do not gain mass by other means are expected to shrink and eventually disappear because the energy carried by the afterglow decreases the mass.

Today it has been discovered that the universe is made up of millions of galaxies, of which the Milky Way is just a dot within billions of stars, worlds, and suns. On Earth, we are a tiny dot in the Milky Way. The Earth revolves around the sun, the solar system's center. Even so, the solar system is a tiny dot within the galaxy, the Milky Way, moving elliptically in the universe. We are inside that insignificant point.

The expansion energy of black holes is of such magnitude that photons (light) having zero mass are reached by the enlargement of matter and by the push to the deformed space-time.

According to general relativity, gravity is caused by a curvature of space and time. Since light travels in a straight line through straight space-time, which we assume to be incompressible, the curvature of space-time causes light to follow a curved path. A black hole is a region in which space-time is curved around it so that all possible trajectories that light could follow end up driving light circularly in the interior between the mass of the black hole and its event horizon.

In Hawking radiation, the energy of gravitons emitted by Black Holes is much higher than photon energy. Hawking radiation is due to the push of the tremendous broadening of matter emitted continuously by black holes.

Hawking's discovery came after a visit to Moscow in 1973, where Soviet scientists convinced him that rotating black holes must create and emit particles. Within these supermassive bodies where the acceleration is very large, complex relativistic phenomena can occur that require exhaustive study and investigation. This reminds me of one of the phenomena that could occur: a spinning disk undergoes a contraction of space on the circumference c but not on its diameter d, i.e. a spinning disk does not fulfill $\pi = c/d$ but $\pi < c/d$ because c contracts, but d does not.

The push to space-time could be faster than light, produced by black stellar objects broadening where there may be permanent energy and matter transformations.

The so-called "gravitational redshift" is when light is shifted to redder colors due to gravity. All types of light, including X-rays, are also affected by gravity.

Where gravity is extreme, the space-time flux is also very intense; the electromagnetic waves that follow the trajectory shown to them by space-time as they pass through that super-expansive field enter a spiral orbit around the object until they can escape. As a result, the light we observe from our frame of reference seems to come farther away from where it comes from. The light path is much more extensive due to light rotating huge times around the "super-black-expanders". This has been aptly named redshift, which causes the light to move to longer wavelengths. This spiral in the path of light caused by the gravitational expansion push has an effect where the loss of energy results in a lower frequency. Since light in a vacuum always travels at the same speed, the energy loss, and lower frequency. Scientists have received more observation time from Chandra over the next year to study this system in more detail as shown in **Figure 9**.

Our Senses Perceive Inertia

We human beings consider the senses the gateway to the outside world. We use them to explore our environment and obtain information about it.

Inertia is the property of bodies to remain in their state of rest or motion as long as no force is applied to them. Inertia is also interpreted as the resistance of matter to change its state of rest or motion. Consequently, a body retains its state of rest or uniform rectilinear motion if no force is acting over it.

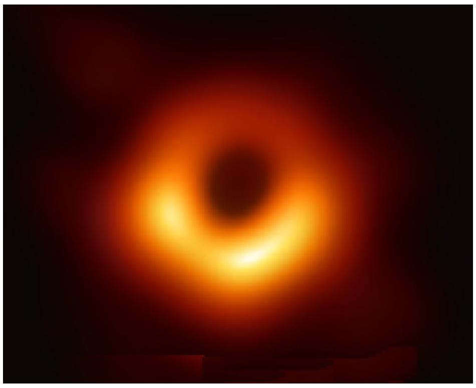

Figure 9. Photosphere: light orbiting a black hole.

Understanding very well Newton's first law or Law of Inertia, we can clearly indicate the contradiction in this law when we were taught the law of gravity.

Newton's first law states that if a given body is not subject to the action of forces, it will maintain its velocity (in magnitude and direction) unchanged.

We must understand that velocity is a vector; a change in velocity is given not only by the magnitude of the vector but also by the change in direction.

The meaning of Newton's first law is that forces are not needed to keep the motion of bodies constant but only to change the magnitude or direction of their velocity. In other words, force is not necessary for a body to be in motion but only to change the state of the motion itself.

When sitting in a comfortable armchair, we say that we are at rest, which is false because we are being pushed upwards; hence we experience the force = mass by acceleration, which is our weight. Being at rest requires not having any force and thus not feeling inertia. For example, this happens to astronauts when they float inside their spacecraft; a body in free fall is at rest because no force is applied to it.

In physics, its change in velocity is erroneously attributed to a non-existent force of attraction; the object in free fall does not accelerate; it is the approach of the earth or its coordinates approaching it at an increasing rate.

When we or any object is on the ground, a force is being applied to it; that force is inertia, it is its weight. Weight is the inertia caused by the change of velocity in magnitude, not in direction because it is upward. Thus, the earth's surface always pushes us in an accelerated upward direction.

This verifies that Newton's law is entirely affirmative but misinterpreted in gravity unless it is considered not as an attraction but a push.

Being immersed in a permanently expanding space-time, we only perceive the change that matter makes by its expansion.

It is interesting to note that the surface of the stellar object pushes the space-time around it, but in a negligible way to small objects with little mass (as demonstrated by Galileo); this is because it is the set of atoms that by their mass (atomic nuclei) displace the same space-time source of this widening.

As space-time is distributed in the concentric spherical area, the acceleration decreases with the radius squared, the height above the earth's surface.

Our senses do not give us enough information to know the world around us. They are complex, but short-range captors of reality. As for quantum reality, there is a so-called dark energy that expands space-time. It is in the "reality in which we live" that we perceive it with our own inertia.

This energy seems to come from an additional internal Dimension. In the following chapters, thanks to the phenomenon of entanglement, we will show evidence of the existence of another Dimension from where dark energy, the origin of time, and consequently GRAVITY.

A colleague of Albert Einstein: Professor John Archibald Wheeler, a Princeton University physicist, said: "We could not imagine a universe that did not contain us because," he says, "It is the act of us observing the universe that makes the universe as it is."

Just as the speed of light is a reference, so is inertia, but local (relative to the center of mass), as shown in gravity and gyroscopes.

Dark Energy

As part of our theory, dark energy is similar to light: dark energy is similar to light: it continuously pervades the present between the outer Dimension and our own (space-time), creating the beginning of time and expanding the Universe.
Our Dimensional reference to explain gravity is based on the fact that the origin of time is the present. Based on quantum theory, this energy comes from the outer Dimension adjacent to our space-time, whose characteristics are the non-analytic state of non-locality, as is the phenomenon of entanglement.

Quantum physics allows for all the energy in the Universe to become a single universal emergent system that produces time in the present before us in 4D space-time. So far, it has been called dark energy since scientists do not know what it is.

The Universe is expanding at an ever-faster rate. Physics teaches us four fundamental forces in the Universe: the strong, weak, electromagnetic, and expansion "gravitational" inertial force. They work over different ranges, have different strengths, and are the reason behind most of the Universe's function as we know it experiences daily.

We still need to learn what dark energy is and how it's expanding the Universe. But we include it here as the source of the "gravitational" inertial force. Dark energy appears to be a type of energy intrinsic to subatomic and outer space. It is an energy that is very strong. Subatomic and outer space has more energy than everything else in the Universe combined.

Dark energy is a space property; it was first discovered in 1998. It is a pressure that pushes expansively from every Planck point in the Universe. Our thesis proposes that time exists thanks to this dark energy due to the expansion of space-time. Neutrinos can travel as ultra-high energy cosmic rays across the possible boundary of the Inner Dimension.

The perennial creation of time occurs in the present time differential "Planck dt". Dark energy generates more space and is active; time is created as space expands. Therefore, time arises in the present along with the expansion of space-time. Gravitation is repulsive, not attractive.

Einstein, in 1917, had the idea of a cosmological constant, a force that counteracts the force of gravity. But now, with this gravitational theory, we say instead that this dark energy is the one that produces gravity instead of countering it, which favors Einstein's ideas.

The fluid-void space-time is filled with virtual space-time particles that spontaneously and continuously appear in the fluid-void space and disappear again. "Micro-dynamos (μDs)". These fluctuations, described by quantum field theory, could be dark energy.

Vacuum energy is an underlying background energy that exists in space throughout the Universe. The vacuum energy is a special case of the zero-point energy that is related to the quantum vacuum.

Why the zero-point energy of the vacuum does not cause a large cosmological constant in quantum fluid dynamics, consistency with the Lorentz covariance principle and with the magnitude of Planck's constant suggests a much larger constant. This huge discrepancy is known as the cosmological constant problem. Solved with our broadening theory of matter.

Our interpretation suggests that this energy comes from a non-local Dimension that harbors dark energy permeating all of our Universe, which gives rise to the gravitational inertial force by push.

Let us now consider dark energy in the expansion of the Universe that occurs not only at the galactic level but throughout the Universe, starting from the quantum substrate. The push of dark energy on matter occurs at the beginning of time in the present permanently and continuously. It coexists throughout the Universe, similar to light. Dark energy is like the photon without delay and without distance that expands space-time.

It has been discovered that this pressure, which we have termed energy-pressure expander (EPE). "Dark energy" accounts for approximately 68% of the total energy content of the cosmos. Exploring the nature of dark energy is one of the main reasons NASA is building the Wide Field Infrared Survey Telescope (WFIRST), a space telescope whose measurements will help clarify the enigma of dark energy. Cosmic acceleration could be caused by this energy component, which would require some adjustments to Einstein's theory of gravity, perhaps revising the sign of the cosmological constant.

Time on Gravity

Time is a by-product of space, as explained by the general theory of relativity (space-time). Its origin is in the present thanks to the perennial accelerated expansion of space-time, causal of gravity, as we have pointed out.

Intervals measure the time of our Dimension. For example, clocks measure seconds, minutes, and hours while the present moment has no interval.

The present moment is not a clockwork phenomenon. You can see that your daily life happens entirely in the present moment. It is always there, constantly renewing itself, immeasurable and fleeting. Because the moment you try to capture it, it disappears.

Time is not absolute. The speed of light is our unique reference. Everything else is relative.

Time is relative; it originates in the present and extends at different expansion rates, affected by gravity and the velocity where the clock is located. (The measure of the time interval).

Time dilation depends on the gravitational field. We live in a moderate gravitational field on the surface of the Earth, so it turns out that we are subject to time dilation without realizing it.

Time passes faster the farther one is from the Earth's surface. Therefore, the time interval measured at a given point near the Earth's surface is greater since the acceleration of space-time is greater at that point.

Gravity (acceleration of push to space-time) varies as we go up, it is slightly weaker on the top floor of a tall building than at ground level, so the time dilation effect is also weaker at higher altitudes.

Near the Earth, the acceleration of space-time is greater, so the time interval measured is greater. Since gravity is lower, the higher you are above the surface of the Earth, the shorter the time interval measured, which means that time passes faster since the time intervals are shorter. Although the effect is too small to detect with human senses, the time difference between different altitudes can be measured using extremely accurate clocks.

Time Lapse and Time Flow

Time is a dimension of "space-time", and with all of space-time, physics also treats time as a "flow". It is an important aspect that we consider to explain the phenomenon of Gravity.

If we consider the flow of time in the present, then intervals or time lapses imminently constitute the past. According to the theory of relativity, a time-lapse or time interval is the amount of time that elapses between two events, as seen by observers at different points in space-time geometry, which we accept and agree upon.

As the flow of time is greater, the intervals of time measured by clocks are greater; that is to say, that time dilates. This phenomenon is known as "time dilation". The flow of time is inversely proportional to the passage of time. In other words, time passes more slowly if the flow is greater.

The greater the gravity, the greater the flow of space-time by the push of the matter expansion.

The present time is not necessarily an instant but the first intervals of the origin of time.

We identify the beginning of time as the flow that emerges in the present with the accelerated expansion of space-time. Therefore, the current present time is an interval of time "Δt", the immanent and transcendent principle of all things.

In the four-dimensional view of the universe of Special Relativity, time and space merge into a continuum called space-time. There is a flow of time as space expands.

And then, time passes, framing all the events that happen. The event appears at all points of the four-dimensional Minkowski space-time geometry.

Depending on the observer, the Lorentz coordinates of an event occurring in a time interval are represented by different numbers that describe the same event. It is because it is another frame of reference:

$C(\Delta t), (\Delta x), (\Delta y), (\Delta z)$ for observer A. $C(\Delta t'), (\Delta x'), (\Delta y'), (\Delta z')$ for observer B.

The following invariant Minkowski equation is a mathematical structure representing continuous time intervals for two inertial observers from their reference frames.

$-C^2(\Delta t)^2 + (\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2$ observer A $= -C^2(\Delta t')^2 + (\Delta x')^2 + (\Delta y')^2 + (\Delta z')^2$ observer B.

But with the invariant, the event is represented by the same number (Rowe, 2013).

As the Universe expansion is accelerated, the invariant number pointing to the coordinates seen from any frame of reference has its adjustments; the study corresponds to general relativity since the velocity of the observers is not constant.

For Newton, time was like a river, a regular, uniform and consistent flow in the same way for all observers. Time is still like a river today, but time does not flow the same for everyone. It is a flow that is not regular and changes according to what we call gravity and the velocity of the point in the geometry of space-time.

What is a fact is that gravity and velocity affect time:

1) Time dilation by gravitation: The flow of time is faster where gravity is stronger.

2) Contraction of time by velocity: The flow of time is slower for someone who is in motion than for someone who is static.

Oscillating systems, such as GPS clocks, have their natural resonant frequency, independent of gravity or velocity of the location. But the change occurs in the measurement of the time segment, depending on the flow of time in the observer's frame of reference according to the dynamic characteristics of the space-time where the clocks are located.

The present is not necessarily an instant, but the first intervals of the origin of time.

The Beginning of Time and Origin of Time

One thing is the Beginning of Time, and another is the Origin of Time.

The beginning of time is the uncertain idea of the Big Bang. However, science shows that the Universe is continuously expanding; that assessment led scientists to believe there was a beginning, with a Big Bang Nucleosynthesis.

The expansion of the Universe, or Hubble expansion, describes it as spatial dimensions that appear to grow or extend continuously. This gave rise to the concept of the Big Bang; however, our thesis approaches it as a continuous event taking place everywhere.

It is not the explosion of a point where all the matter and energy of the Universe is concentrated. On the contrary, it is a notion localized in the quantum medium. A permanent event, given the continuous creation of time in the present and the accelerating expansion of our Universe. Our Dimension has no central point; everything can be considered the center of the Universe, such as yourself.

The time scale of the Universe is very long compared to that of human life. It was, therefore, not surprising that until recently, the Universe was thought to be essentially static and unchanging in time.

This argument about whether or not the universe had a beginning persisted into the 19th and 20th centuries. However, it was conducted mainly based on theology and philosophy, with little consideration of observational evidence.

Since the origin of time is the present and its expansion is different according to the mass at each place in the universe, the beginning of time Big Bang concept looks like it does not work.

Since time is relative to the gravitational characteristics of the place where it is established, the only way to measure it is from the present; it is not possible to measure it from a past origin.

When talking about the origin of time, most people think that it happened millions of years ago and relate it to the "Big Bang", but the time origin is the present.

But our concern in this book is not the beginning but the origin of time.

Time is produced as space expands. Therefore, for time to exist, the Universe's space must expand. Time originates in the present and extends along with space-time, where events are framed.

Time is continuously created; it exists from the present, and as it passes, it is more extensive; its magnitude is more significant and considerable, as history shows.

For light to be produced, it must move, and it does so at the constant speed "C"; otherwise, it does not exist. Therefore, there is no light if it does not move. Since the speed of LIGHT is the relation between space and time that is always constant: "C = S/t," also the only fixed reference we have. Then, for time to exist, the space of the Universe must be in continuous increase, that is, in expansion.

Time exists thanks to space and the necessity of the motion of the Universe, whose velocity links space with time. Space is dispersed, not from a specific point, but everywhere and in all directions.

The present is the only moment in the entire Universe that is simultaneous. From the present, time and space expand at a different rate according to the associated mass. So here I ask myself: what telescopes see does not correspond to distance because time is associated with matter, not only visible but also dark matter.

In particle entanglement, particles manifest themselves in space at the origin of time. We live in a time in which decoherence process permanently collapses with our presence.

Expansion occurs together with space. Space-time is always there with all the information to act and create the new scenario. Space-time is intertwined; that is, our Universe exists from the present. Undoubtedly, we live in the past. All our experiences are placed in the past, one of which manifests in the present, the origin of time.

Let's look at it this way: you look in the mirror, and the reflected image is from the past because the image traveling at the speed of light has had to travel twice the distance between your face and the mirror. And for that, it takes time.

All the possibilities of what can happen are present, thanks to the past. But, as we have seen, all events are framed thanks to the expansion of space-time.

The chances of options are there, but not the impossible. The before now is a probabilistic creation that depends on past events. What is done now affects the possibilities of what can be established in the next present.

5. Conclusion

Considering gravity as attraction is an assumption that no longer works. It is not under the Planck mass where the real problem of the physics of Quantum Gravity begins; it is in space-time as a small string and then as a small sphere whose radius is the Planck length. Gravity is a permanent influx of quantum energy affecting matter. A Riemannian (but expansive) metric allows one to define various geometrical notions, such as the length of a curve relative to the gravitational field in an accelerated expanding space-time fluid. It is easier to understand Einstein's theory of relativity governing the motion of stellar objects by considering space-time as a fluid pushed not only by the gravitational effect of stellar objects but also by their movement.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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