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Dark Energy in Gravity

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Abstract

This paper explores space-time with the Minkowski equation, trying to integrate using the three manuscripts presented to the Open Journal of Philosophy (OJPP) a "new theory of gravity" by introducing the concept of space-time flow. Gravity is a push rather than a pull, an idea presented in the first manuscript. Gravity is the inertia, the shape (frame) of space-time produced by dark energy. The space-time surrounding you provides the force that pushes you upwards, but it doesn't increase the diameter of the Earth. The sensation of gravity is actually caused by the accelerated flow of space-time against you, which acts as a mirror. The Earth's expansion is apparent; creates the illusion, but Earth does not expand; rather, the space-time flow emanating from the Earth generates gravity. Einstein's theory of relativity explains that gravity results from the curvature of space-time caused by the presence of mass and the background dark energy. "Dark energy, introduced from all directions," which exists throughout the universe in space-time, is responsible for the universe's accelerated expansion. One way to expand space-time is through the concept of cosmic inflation, which suggests that the universe lives a continuous widening of space-time. Free fall and relativity theory support this claim. Dark energy pushes (pressure) space-time inside the atoms, and the space-time, as in a nozzle, produces an accelerated flow which is gravity. Dark energy floods the whole space and produces positive pressure. It is a non-local/non-analytical energy, an omnipresent that pervades everything. Dark energy is a space-time property; it was first discovered in 1998. The pressure makes space-time emerge from every point of the Universe and push it expansively. Quantum physics suggests that all the energy in the Universe can form a single universal emergent system, which produces time in the present before us in 4D space-time. This is dark energy. The expansion of space-time is universal and occurs everywhere. When this expansion occurs within atoms, it produces a space-time flux, which is gravity. The general expansion produces it and counteracts it. Pushing space-time outside of Earth (Earth does not expand, just looks like it does) is this space-time flux that makes Earth coordinates move upward, to make it feel like falling into Earth. The apparent

matter expansion is its complement mirror. Here, we present Gravity as accelerated space-time flow going out from massive objects.

Keywords

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

1. Introduction

Dark energy, is the given name to the mysterious influence driving the accelerated expansion of the universe.

In physical cosmology and astronomy, dark energy is a hypothetical form of energy that permeates all of space and tends to increase the rate of expansion of the universe. Dark energy is the most popular way to explain recent observations that the universe appears to be expanding at an accelerating rate, in the standard model of cosmology.

High-precision measurements of the universe's expansion are required to understand how the expansion rate changes over time. In general relativity, the evolution of the expansion rate is parameterized by the cosmological equation of state. Measuring the equation of state of dark energy is one of the biggest efforts in observational cosmology today.

There is only one phenomenon of general space-time expansion in the Universe, but when that expansion encounters matter, the space-time that constitutes matter requires all the space-time to expand, but it is inside matter that in order to expand inside to the network of atoms nucleus requires speeding up its acceleration.

That speed-up acceleration of space-time makes an accelerated flow that goes out from matter; this is the gravity inertia.

The original universal expansion product of dark energy is an "anti-gravity" force, sometimes referred to as quintessence or a cosmological constant; this force should act counteracting the additional speedup of space-time, but the universal expansion.

The universal expansion product of dark energy that drives the universe's expansion is the cause of what we call the nozzle effect that produces gravity. But this universal expansion is an anti-gravity force that counteracts only the additional speedup of space-time flux, which is gravity. (Produces and counteracts it).

A pressure difference causes acceleration within a flow. Incompressible fluids have to speed up when they reach a narrow constricted section in order to maintain a constant volume flow rate. This is why a narrow nozzle on a hose causes water to speed up. (Similar Phenomenon).

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 (Santos-Pereira et al., 2021).

We base our theory on the Minkowski equation. In mathematical physics, Minkowski space-time is a four-dimensional, zero-curvature Lorentzian manifold used to describe physical phenomena in the framework of Einstein's special theory of relativity. The model was developed by the German mathematician Hermann Minkowski.

In Minkowski's space, three ordinary spatial dimensions and an additional temporal dimension can be distinguished so that they all form a 4-variety and thus represent space-time.

We refer in detail to the terms of the Minkowski equation in Sections 3 and 4: Definition and Descriptions of this letter.

The Minkowski equation represents our four dimensions. It is a representation of our space-time, which is given below.

$$\Delta s^2 = \Delta x^2 + \Delta y^2 + \Delta z^2 - \left(C \cdot \Delta t\right)^2$$

Thus, for the observer at rest, this quantity and for the observer in motion, this quantity is exactly the same. This is also known as invariance. It means that this quantity is invariant under the law of space-time. (Special Relativity).

Matter Atoms are full of always expanding space-time. (Considering the vastness of the universe and our limited understanding of it, the notion of inter-proton-electrons space-time is definitely intriguing. It leads us to ponder about the existence of space-time beyond our current comprehension. Exploring this concept could reveal fascinating insights that could change our understanding of the universe. In physical cosmology and astronomy, dark energy is an unknown form of energy that drives the universe's accelerating expansion.

The universe is composed of space-time, formerly known as Ether. This universe's accelerating expansion occurs in Space-Time but does not expand with matter, even if it is under a reference frame completely apparent.

This statement agrees with general affirmations here you can see it in a couple of their references:

1) "Hubble's law is consistent with a general expansion of the space between galaxies (or galactic clusters), and is not a particular characteristic of the galaxies (clusters) themselves. This statement means that the galaxies themselves are not changing in any way; only the regions between them are expanding with time." (Kolecki, 2003).

2) "*While matter* (*both normal and dark*) *and radiation become less dense as the Universe expands owing to its increasing volume*, *dark energy*, *and also the field energy during inflation*, *is a form of energy inherent to space itself. As new space gets created in the expanding Universe*, *the dark energy density remains constant.*" (Siegel, 2023).

We can see in this Reference (Siegel, 2023) an animated GIF that shows: As space-time expands, so does the wavelength of light (see **Figure 1**).

Space-time is outside matter, but it is also inside matter. Let's say better matter is inside space-time. Matter is full of space-time that is also always expanding.

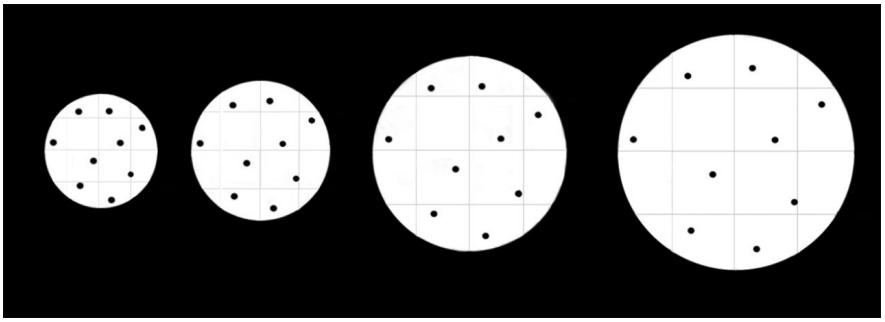

Figure 1. Matter dilutes as the universe expands.

In 1909, E. Rutherford experimented by launching alpha particles, or helium nuclei, at a thin sheet of gold. To his surprise, most of the particles passed through the sheet with no resistance, while some bounced back. From this, Rutherford concluded that gold atoms must have much empty "space-time" since only a few particles were reflected back.

It was discovered by Rutherford that the few particles that bounced back collided with the nucleus. This led to the realization that atoms comprise a compact, heavy, and positively charged nucleus surrounded by electrons, with many "empty space" in between. It is important to note that gold was not unique but merely the element used in the experiment (see **Figure 2**).

Quantum theory states that electrons are located at specific distances from the nucleus, while the surrounding space-time is filled with "virtual particles."

"A virtual particle is a theoretical transient particle that exhibits some of the characteristics of an ordinary particle while having its existence limited by the uncertainty principle, which allows the virtual particles to spontaneously emerge from vacuum at short time and space ranges." (Wikipedia, 2024).

The atom is composed of a nucleus and a shell, which is formed by an electron cloud. The shell of the atom is significantly larger than the nucleus.

Atoms consist mostly of empty space (space-time). At the center of the atom lies a nucleus, which is a small, dense ball that houses all the protons and neutrons. Although the nucleus occupies less than a billionth of the total volume, it accounts for almost all of the atomic mass.

If matter is made up of atoms, which are mostly empty space, it means that the atoms that make up our bodies are also mostly empty. We are made up of more space-time than mass.

The only barrier that space-time has in its free expansion is the nuclei of atoms.

Matter does not expand (only virtually). In case the space-time meets nuclei of atoms inside itself, energy appears in the form of acceleration that pushes the adjacent space-time mutually until it reaches the surface of the Earth (massive object). In this case, a jet of space-time leaving at an acceleration of 9.8 m/s^2.

That acceleration, "energy without mass involved," that appears is for us the DARK ENERGY.

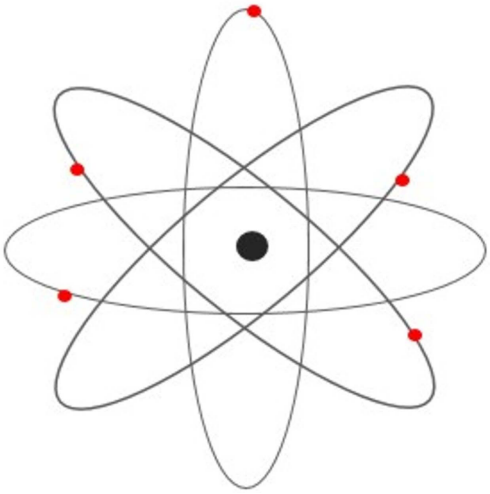

Figure 2. Rutherford atom.

In the first article, we presented the phenomenon of gravity as it appears to be an expanding matter, but in reality, it is just the accelerated space-time flux. (It is the same thing under the reference frame you see it).

We might have experienced the relative velocity effect while standing at the train station. When the train next to us was moving, we felt like our train was moving. A similar thing happens with space-time. If you are standing in front of a track and start moving forward on it, it is as if the space-time of the track is coming towards you while you remain stationary.

The figure in the link featured illustrates the concept I aim to convey (https://youtu.be/UTVl5gU9lwI).

Photo from NASA, Apollo 8 astronaut Bill Anders.

From the point of view of relative movement, it is the same as saying, I go to space, and that space comes to me. It is the mirror as if space comes to us, which is the same as if we go through space.

Please pay close attention to GIF 1 animation, which depicts the illusion that the Earth is expanding. But this scenario is the flux of space-time coming out of the Earth, resulting in a fall towards Earth. You are falling towards the Earth, which does not change in size.

However, the incoming space-time flux through you makes you perceive the Earth as approaching you. And if you are at the Earth's surface, your weight is due to the push-up.

This is apparent due to its image through space-time expansion.

When matter interacts with space-time, it behaves like many atom nuclei that keep their distance. Due to the pressure of cosmic inflation, to escape this cluster is continuously given by accelerating the space-time flow.

"It is similar to closing the nozzle of a hose, the water increases its velocity."

Our study of Gravity is based on the behavior of an accelerated space-time flow generated by the driving force of the general expansion called Dark Energy. The leading theory is that dark energy is the "cosmological constant," a concept

by Albert Einstein.

Today, scientists think the constant may represent the energy of the vacuum of space. Instead of being "empty," this would mean space is actually exerting pressure on cosmic objects. If this idea is correct, the distribution of dark energy should be the same everywhere (Office of Science, n.d.).

2. Definitions

It is only possible to fully understand Dark Energy through its definition.

Normally, people talk about living in three dimensions plus time.

But Minkowski, Einstein's professor in mathematics, taught us that in order to incorporate time as a fourth dimension also measurable in meters, it was necessary to associate time with the speed of light.

$$-\left(C \cdot t\right)$$

2.1. Space-Time Representation in the Minkowski Equation

Minkowski space-time is a type of cartesian form of representing space-time.

The space-time geometry is the same for two different observers in relative motion. Therefore, whatever space-time we create in that situation, the space-time interval must remain invariant.

$$\Delta s^2 = \Delta x^2 + \Delta y^2 + \Delta z^2 - \left(C \cdot \Delta t\right)^2$$

The Minkowski equation uses Cartesian coordinates but has been reduced to one spatial dimension to simplify certain ideas in space-time representation.

$$\Delta s^2 = \Delta x^2 - \left(C \cdot \Delta t\right)^2$$

Minkowski's space-time simplified representation has two axes—the x-axis representing the spatial dimensions x, y, and z, and the $-C{\cdot}t$ axis representing the time light speed dimension. $C{\cdot}t$ to denote: (speed of light) × time. The unit of ($C{\cdot}t$) is the same as that of "x" (meters). "C" represents the speed of light, which has a unit of meters per second. Therefore, "$-C{\cdot}t$" is a dimension in meters, just like Cartesian x, y, and z.

2.2. A Deeper Vision of Our Time Dimension –($C{\cdot}t$)

There is only one variable, time, as the speed of light is constant: a dimension where time runs with light.

When an object moves through time, it is not physically moving through space. However, it still moves at the speed of light through time.

If one moves in space, one adjusts the velocity in time.

Conversely, the equivalence principle states that all effects of gravitation disappear and that we locally obtain the metric of the special theory of relativity (SRT). This is the Minkowski metric. Thus, we can choose at each point of the manifold a coordinate system in which the Minkowski metric is valid.

When a massive object moves in an elliptical trajectory, it experiences free fall,

which means that no force is exerted on it. This applies to objects like the Earth, the Moon, or any satellite. Thus, from its own frame of reference, the object is a system with a flat Minkowski metric.

When a large object moves in an elliptical path, it falls freely, meaning that no force acts upon it. This principle applies to objects like the Earth, the Moon, and satellites. Hence, when viewed from its own perspective, the object represents a system with a flat Minkowski metric.

Thus, from its own frame of reference, the object plus the space-time that the object experiences in its trajectory is a system with a flat Minkowski metric.

Minkowski space is a concept that combines inertial space and time manifolds with a non-inertial reference frame of space-time.

Normally, people talk about living in three dimensions plus time.

But Minkowski, Einstein's professor in mathematics, taught us that in order to incorporate time as a fourth dimension also measurable in meters, it was necessary to associate time with the speed of light

$$-(C \cdot t)$$

Here, there is only one variable, time, since the speed of light is a constant. A dimension where time runs with light.

2.3. Virtual Inertia

Like energy, we associate inertia with a mass; we call virtual inertia the inertia without associated mass.

The concept of inertia refers to the tendency of objects to resist changes in their motion. This is closely related to the curvature of space-time, which is affected by the presence of matter and energy. In other words, the distribution of mass and energy in the universe determines the shape of space-time and how objects move through it. Even relativistically, the universe expands geodesically. The connection between space-time and inertia is shown by the intrinsic link between them. The energy in space-time changes its shape according to inertia.

Let's see virtual inertia from space-time as the main frame: It is the shape of space-time.

Gravity manifests itself by the Inertia: $F = m \cdot g$

(F / m) = acceleration of space-time flow.

It is accelerated radially from Earth (Example) at 9.8 m/sec^2 at its surface.

This force is the same one that pushes you upward on the surface of the Earth. It is caused by the apparent broadening of matter, which is relativistically the same as the flow of space-time, radially outward from the Earth.

Pushing space-time outside of Earth (Earth does not expand, just looks like it) is this space-time flux that makes Earth coordinates move upward, to make the falling into Earth.

As we saw in the representation of space-time, according to Minkowski, its component is $(-t \cdot C)$.

The inertia that we feel due to our weight is caused by the accelerated flow of space-time.

This is a virtual inertia (no mass involved) that does not affect the Cartesian spatial dimensions.

Then, its shape is accelerated so that when it passes through objects with mass, it causes a force (what we call inertia). $F = m \cdot a$.

The present moment is created continuously in the creation of a new time by one of the possible outcomes in the Universe.

2.4. The Measure of the Time Interval

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. Once time has been created, it 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 (see **Figure 3**).

There is no future. The present is created by all possibilities of realization at the coherence.

The present moment is created continuously in the creation of a new time by one of the possible outcomes in the Universe.

3. Description

When we are on the surface of the Earth or any massive object, we experience a flow of space-time that moves outwards radially in an accelerated manner. Once this flow of space-time is outside the Earth, it is distributed around in accordance with the "Inverse Squared Law," which is determined radially by the height of the Earth.

Usually, people talk about living in three dimensions plus time.

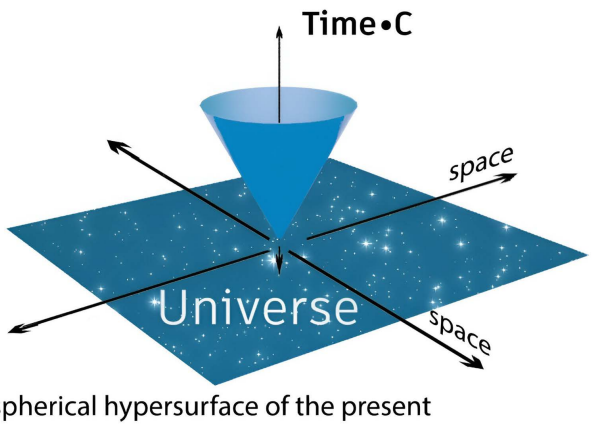

Figure 3. Time-light speed dimension.

But Minkowski, Einstein's professor in mathematics, taught us that to incorporate time as a fourth dimension also measurable in meters, it was necessary to associate time with the speed of light.

$$-(C \cdot t)$$

This theory is based on Minkowski's representation of Space-Time.

Minkowski space is a concept that combines inertial space and time manifolds with a non-inertial (unaccelerated) reference frame (shape) of space and time.

That means that time is referenced to the speed of light: when an object moves at the speed of light through time.

3.1. Space-Time Representation in the Minkowski Equation

Representing space-time using Cartesian coordinates may not be entirely reasonable, as, besides the kinetic energy of orbiting objects, the effects of space-time are radial and are caused by gravity. However, polar or spherical coordinates can provide greater mathematical simplicity and a better comprehension of the phenomenon.

A point in the Cartesian plane, with coordinates (x, y), can be represented in polar coordinates (r, θ), with a radius and an angle. Also, the spherical coordinate system is used in three-dimensional Euclidean spaces. It comprises three mutually orthogonal axes that intersect at the origin. The first coordinate indicates the distance between the origin and the point, while the other two represent the angles required to rotate to reach the position of the point.

Minkowski space-time is a form of representing space-time.

The space-time geometry is the same for two different observers in relative motion. Therefore, whatever space-time we create in that situation, the space-time interval must remain invariant.

$$\Delta s^2 = \Delta x^2 + \Delta y^2 + \Delta z^2 - (C \cdot \Delta t)^2$$

The Minkowski equation uses Cartesian coordinates but has been reduced to one spatial dimension to simplify certain ideas in space-time representation.

$$\Delta s^2 = \Delta x^2 - (C \cdot \Delta t)^2$$

In Minkowski's space-time simplified representation, there are two axes—the x-axis representing the spatial dimensions x, y, and z, and the $-C{\cdot}t$ axis representing the time speed dimension. $C{\cdot}t$ to denote (speed of light) × time. The unit of "$C{\cdot}t$" is the same as that of "x" (meters). "C" represents the speed of light, which has a unit of meters per second. Therefore, "$C{\cdot}t$" is a dimension in meters, just like Cartesian x, y, and z.

We will represent changes in velocity ($\uparrow V$ increase) as acceleration for better interpretation. Expansion is always positive, so we will probably not use ($\downarrow V$ decrease) to energy transfer out.

Dark Energy is represented in the acceleration of space-time flow.

In our time dimension, according to Minkowski: $-(\uparrow V{\cdot}t)$ to energy transfer

in.

Dark Energy is a concept that explains the acceleration of the universe's expansion.

It represents the space-time flow to speed up. The procedure used by space-time to get out of the matter. Similar to a nozzle.

When a nozzle is used on a hose, the cross-sectional area of the opening decreases, which increases the fluid's velocity according to the continuity equation. This increase in velocity results in the water coming out faster from the nozzle.

However, speed is relative: The speed of an object is always relative to something else. For example, the Moon orbits around the Earth, the Earth revolves around the Sun, the Sun moves around the center of the Milky Way, and the Milky Way itself is in motion too. If we were to add up all of these velocities at a particular moment, we still wouldn't have an absolute velocity since there is no fixed reference point for all movements. Therefore, there is no such thing as absolute velocity. Yes, the speed of light is a superior speed limit.

In the accelerated expansion, a large amount of virtual energy (Dark energy) is coming from everywhere "ds". Not to mention Planck length, but a mathematical differential.

There is an introduction of accelerated space-time flow (Impulse by the Dark Energy of the Universal Expansion. And coming from every matter atom's nucleus network as a nozzle effect.

Let's analyze it fiscally:

Within the context of space-time, we can analyze two concepts: flow and pressure, which behave like fluids. The case of the nozzle effect.

Now, the space-time comes out with its normal accelerating expansion, but with additional energy, it has an accelerated space-time flow. Used to get out the "Atoms nuclei nozzle".

It looks like we have only two dimensions, the spatial and the temporal, and maybe only one: the "time-speed" dimension. That incorporates both time and speed, which is a function of coordinates.

3.2. Concept of Energy

Dark energy is what moves space-time in its permanent creation and expansion.

Work and energy are fundamental concepts of Physics. Work is said to be done when a force (push or pull) applied to an object causes a displacement of the object. We define the capacity to do the work as energy. So, work and energy have the same units.

(The newton-meter (N-m) is a unit of energy equivalent to 1 joule.)

The newton is a SI-derived unit defined as the force required providing an acceleration of 1 m/s^2 to an object of 1 kg mass.

In energy, we have a Force, a distance, and a mass.

This Force = $m{\cdot}a$ = mass·acceleration.

If we remove mass from our concept of energy, we are left with only acceleration over a distance. That is the dark energy that moves the space-time flow. A

kind of Energy with no mass involved.

That means for us, dark energy is the acceleration that is used by the flow of space-time to get out of every atom of matter. "The nozzle effect" refers to the change in water flow when a nozzle is attached to the end of a hose. The same phenomenon appears when space-time expansion inside matter.

If we remove the mass, we are left with only an acceleration in a path.

3.3. Dark Energy

Energy is normally associated with mass. The dark energy is not associated with mass.

Physics suggests that space is filled with dynamic energy, known as dark energy, which causes an acceleration in the expansion of space-time flow. (Gravitational dynamical energy).

The acceleration of the fluid of space-time. This space-time, as all of it is in expansion, the nozzle effect in the matter of the space-time is caused by the push for expansion increments in the space-time pressure and flow, coming from "Universal Global Expansion" and coming out from massive objects. In an accelerated form.

In a black hole that much space-time inside atoms?

The expansion of space-time is what makes you see the trajectories of elliptical orbiters; they are really straight-line trajectories called Geodesics.

It's worth noting that mass is not a prerequisite for energy, so gravity's flow of space-time can possess energy without the need for mass.

The minus sign in the Minkowski space-time metric arises from the combination of space and time in special relativity. In this metric, the time component is multiplied by −1 to account for the different sign conventions between space and time intervals. This allows for the proper formulation of the space-time interval, which is invariant for all observers in special relativity. That whose effect on the universe's expansion is the opposite of that of matter and normal energy. Minkowski negative sign.

The flow of space-time is what makes you see objects orbiting or falling. But for objects in free fall, no force is exerted on them.

The accelerated expansion of space-time is equivalent to the accelerating expansion of the Earth, as we saw in our first publication, Gravity Is Not Attraction; It's a Push, we explain the real behavior of gravity on objects over the surface of Earth: Objects are accelerated and pushed upwards, that's why you feel your weight by the inertia. (The effects are the same).

Dark energy is the unknown energy source causing the acceleration of our universe's expansion.

Dark energy could be a fifth fundamental force of the universe instead of gravity. (The known four are the weak force, the strong force, dark energy, and electromagnetism.) .

It is the apparent expansion of matter that we feel as a push is the inertia left

by the space-time fluid that overcomes us, leaving us to feel the inertia in our mass.

$$\text{(Virtual Inertia = the shape of space-time).} \quad S = \left(-\uparrow V \cdot \downarrow t\right) + X$$

We call it virtual Inertia because no mass is involved in it.

In Minkowski notation, an increment in C remains C then time runs over the speed of light.

The transfer of velocity in our time dimension involves the transfer of dark energy. This occurs within the same expanding space-time that we experience and is known as the nozzle hose phenomenon. When matter is present, it creates an acceleration that is distributed radially and spherically around its contour. This acceleration is driven internally within each spatial differential and is called dark energy.

Gravity manifests itself by the Inertia $F = m{\cdot}g$

(F/m) = acceleration of space-time flux.

3.4. Pushed by Dark Energy

Time runs at the speed of light. But by substituting C for V, then time can expand or contract in exchange for energy within the same dimension.

$$S = \left(-\uparrow C \cdot \downarrow t\right) + X$$

Hence, we believe in the following question: Does expansion only occur in the time dimension?

As there is a velocity in the Minkowski expression included in the time dimension of space-time in order to be incorporated into the other coordinates, it indicates that time per se has attributions in the spatial dimensions.

The existence of a yet unconfirmed dark energy floods the whole space and produces positive pressure. An omnipresent "force" that pervades everything. Dark energy is a space-time property; it was first discovered in 1998 (Wang, 2021).

It is a pressure that makes space-time emerge from every point of the Universe and push expansively.

The space-time's spread out flux acceleration expansion is given in proportion according to the mass of the bodies. For example, the Sun has a greater expansion than the Earth, which produces a greater push to the space-time around the Sun than the flow produced by the Earth around it.

The expansion of the space-time in matter produces gravity, which is a space-time flow coming out of the massive object.

When space-time expansion occurs within the internal space-time of matter, it is impacted. This is because the matter is a container, the expansion encounters an obstacle that the expansion must overcome. The space-time flow creates a nozzle jet effect through which expansion escapes matter. This flow, which emanates from the massive object, is responsible for the phenomenon of gravity.

The flow of space-time that occurs during general expansion once out of mass decreases with the radius squared, around the celestial body. Gaussian notation.

All objects on Earth's surface experience a uniform acceleration of 9.8 m/s^2, which is commonly referred to as gravity.

In our previous articles, we explained this phenomenon as the apparent illusion of the Earth expanding, which is caused by successive expansion of each atom's shell. However, it is actually the space-time dimensions flux that are going radially out from Earth that create this illusion. (Same phenomenon seeing from a different frame of reference.)

We perceive the space-time expansion because of its inertia, the shape of space-time crossing us.

If we are in a falling state we just see the space-time accelerated movement of the coordinate's axis.

The expansion is only one, but it manifests expansion disturbance in matter. The disturbance is a result of space-time flux escaping matter due to expansion within the atoms.

That disturbance produces an apparent matter broadening but not. Space-time flux escaping from matter makes you view approaching earth's surface or feel the inertia of the space-time flux. That makes your weight.

All this additional expansion is due to the expansion of space-time within the atom. (Nozzle effect).

The expansion that originates in the emerging space-time is present not only in astronomy but also in the atoms that make up our being. Inter-proto-electronic space (Quirós, 1954).

3.5. Gravity Is Not an Attraction Force

The concept of inertia refers to the tendency of objects to resist changes in their motion.

The shape of space-time can be described as inertia. These represent the relationship between the path shape of space-time, and its inertia manifested when mass is present.

The distribution of mass and energy in the universe determines the shape of space-time and how objects move through it. But in a relativistic way, the universe is just expanding geodetically.

The new reality is that you have a space-time flux crossing us, moving forward outside radially.

Matter doesn't expand, only space-time dimensions continuously emerge to create the Universe's expansion.

All objects on the Earth's surface experience a force due to the accelerated movement of the space-time flux coming out from Earth. (Inertia, which is the space-time flux shape).

You are pushed upwards by the surface of Earth; space-time is approaching you from the ground, creating space-time-associated Inertia. Earth's surface holds you pushing up due to Inertia, which manifests as your weight.

Matter does not expand; only space-time dimensions do, continuously accele-

rated and increasing flux. The universal expansion is like a coordinate's expansion.

To make it clear, the size of Earth remains constant as the space-time flux is accelerating and moving away from matter. This means that there is no expansion of Earth. However, the flux of space-time is passing through us, creating a relationship between time and its coordinates. As a result, the flux of space-time that is crossing us at an increasing speed makes us see Earth expanding, or more accurately, makes us fall into Earth.

In previous presentations of this theory, there was an apparent matter expansion. It looks like there is an expansion, but there isn't. It is only as a mirror due to the space-time flux coming from matter that makes us see it in that apparent relative way.

Pushing space-time outside of Earth (Earth does not expand, just looks like it) is this space-time flux that makes it, being gravity.

3.6. Let's Analyze an Object Falling down to Earth

The object is free in a rest state; no force acts over it. There is no acceleration over the falling object. The acceleration the object couldn't see is the spatial coordinate "earth approaching."

Gravity is the space-time flux coming out from the "Earth" massive object. The expansion we see of the matter is not the matter itself; it is the space-time flux coming out of massive objects. So you are falling and feel going down, and are the coordinates moving while you are inertial = 0: falling.

Relative movement states: It is the same as saying, I go to space, and that space comes to me. It is the mirror as if space comes to us, which is the same as if we go through space.

In Free fall, the acceleration is by coordinates. The observer will experience coordinates acceleration but not acceleration of their own and thus no "g" force.

According to our Space-Time Expansion Theory, the expansion itself is made continuously thanks to the dark energy, which also makes the space-time accelerated expansion function according to the mass quantity, including the object's density distribution.

The nozzle effect on the expansion of space-time when matter makes the Accelerated Space-Time Flow = Gravity.

The increased speed of the space-time flow is the gravity.

Once out of matter, the acceleration of space-time flow energy is radially spherically distributed in the same space-time environment around the massive object.

The behavior of objects falling down to hit the soil. They are in free fall, so there is not any force acting over the bodies. You may analyze this gravity behavior as the Earth has an expansion, which is the same as there is a space-time flux coming out radially from Earth.

The way we perceive the movement of orbiting bodies is actually just our perspective. "Weltanschauung". The truth is that these bodies move in a straight

line at a constant speed. The difference lies in the way that space-time appears to each of these orbiting objects. The elliptic path is a geodesic path. From our point of view, being inside an orbited object with a great space-time flux.

Stellar bodies move in a straight line and maintain a constant speed due to the principle of inertia. They do not even realize that they are orbiting. However, when they are in an elliptical orbit, the deformation of space-time causes their translational velocity to stay constant at all times.

Space-time is a continuous entity that consists of four dimensions. According to Einstein's theory of relativity, all physical events in the universe occur within this space-time. As we saw in the representation of space-time, according to Minkowski, its component is $(-t \cdot C)$. Time appears at the present, emerging together within space-time expansion. The inertia that we feel due to our weight is caused by the expansion of space-time, which is observed in the acceleration of the space-time flux coming out from Earth. Earth expels space-time flux with Energy coming through its component $(-t \cdot C/\text{sec}^2)$. 9.8 m/sec^2 at Earth's surface.

Gravitational energy, which is distributed around a massive object, decreases its acceleration with the radius squared. This energy takes the form of concentric spheres, which represent the trajectory of space-time, or curvature. The curvature is perpendicular to the flow lines of the fluid expelled by the mass object. All of this constitutes space-time.

There are two different conventions for representing the spatial and temporal dimensions using plus and minus signs. One convention involves using a negative sign for the temporal dimension and plus signs for the spatial dimensions, while the other involves using a positive sign for the temporal dimension and negative signs for the spatial dimensions. Both conventions are valid, but it is important to be consistent in your use of signs when discussing and calculating. Here, we will use the convention of using a negative sign for the temporal dimension to ensure clarity in our explanations.

Hence, we believe the following expansion occurs in the time-speed dimension. Or call it a better "time-light speed" dimension of space-time.

3.7. Dark Energy Is Uniformly Distributed in Space and Time

Using the eROSITA space telescope, scientists have discovered that dark energy is uniformly distributed in space-time (Innovation News Network, 2023).

The expansion of space-time is universal and occurs everywhere. An accelerated space-time expansion expulsion inside matter happens when space-time tries to spend and encounter an obstacle (the nuclei network). A nozzle effect is produced. (We are always being supported by space-time behavior as a fluid) (Santos-Pereira et al., 2021).

That pressure produces a caudal flow of space-time, which produces gravity = Space-time accelerated flow.

The expansion of matter produces gravity through accelerated flux in space-time. The expansion outside of matter can counteract this effect. In fact, it does so by distributing the energy in the form of acceleration with the inverse of the

square rule.

To explain this acceleration, we need a source of "dark energy".

The existence of dark energy and cosmic acceleration is a surprise (Chiu et al., 2023). I-Non Chiu from National Cheng Kung University in Taiwan region, in collaboration with LMU astrophysicists Matthias Klein, Sebastian Bocquet, and Joe Mohr, has published a first-of-its-kind study. To do this, they used the eROSITA X-ray telescope, which focuses on galaxy clusters.

Klein said: "We can learn a great deal about the nature of dark energy by counting the number of galaxy clusters formed in the Universe as a function of time, or in the observational world as a function of redshift."

The general expansion plus the additional expansion of space-time around massive bodies of matter guide objects away from each other in a straight radial direction without changes in velocity, consequently forming their elliptical trajectories that are geodesics upon reference frame.

The additional expansion of space-time at the internal space-time of the atoms causes the "nozzle effect," an accelerated flow of space-time outward of matter.

The ever-expanding space-time around the celestial bodies.

Space-time accumulated around the celestial bodies accelerates due to the expansion with negative signs of the emerging time that is born in the present.

It is here in the inter-electron nucleus space-time of the atom, where we estimate the primary universal expansion push to accelerate the escaping flux. In accordance with to our first article: Thalman (2023).

Acceleration is the only thing that causes a deformation in space-time.

(Classic) The planets in our solar system follow elliptical orbits around the Sun.

(GR) Since planets move along geodesics, they are in a state of free fall, moving in a straight line at the same speed without realizing they are orbiting.

There is a relationship between space-time and inertia, where the change in the shape of space-time is controlled by inertia. Or better, Inertia is the shape or frame of space-time acceleration. The elliptical trajectories we observe are a result of the curvature of space-time.

Once the space-time flux goes out of matter, the rate at which space-time moves always increases, but the amount of acceleration decreases the farther it is from massive objects. This creates a weaker flux of acceleration as you move away from the object.

Einstein said acceleration and gravity are indistinguishable from each other.

So, The Space-Time Flow acceleration is Gravity.

Because of the magnitude of GG, the gravitational force is very small unless large masses are involved.

Gravitational fields are used to be represented in Cartesian form, being simpler in a radial form.

By mass, electrons are approximately 1800 times smaller than protons, making the atom mostly space-time, with a nozzle of nucleus interfering with space-

time expansion.

Then, already on the surface of the earth, it reaches space-time as a fluid leaving at 9.8 m/s^2, space-time moves out with less and less acceleration.

Now let's see if space-time emerges (a fluid that we do not see, but we feel it).

We feel by our mass, the weight, the inertia that produces the acceleration of that fluid.

There is an intrinsic relationship between inertia and space-time flow that produces inertia over matter; the phenomenon is known as gravity in classical physics.

There is one expansion of the Universe that occurs in Space-time. The new space-time begins to arise, emerge, and expand everywhere, but when space-time is inside, matter's atoms occur, an acceleration flux in expansion.

Space-time continues to expand, but matter can interfere with this expansion. This is because matter expands from within the shell of the atom, which is part of the space-time. For space-time to expand, it needs energy. It obtains this energy in an accelerated form, without the presence of matter. Space-time then uses this energy to escape from matter and, when outside of it, distributes it uniformly in concentric spheres of equal acceleration. Decreasing with the radius squared.

When Minkowski introduced velocity in time as a dimension in meters, he presented time speed as the only dimension among all the dimensions in which we live and exist. In other words, space-time can be represented as a single dimension.

It follows that with only the term $(-C{\cdot}t)$, we have a space-time representation.

Minkowski space combines space and time manifolds with a non-inertial reference frame.

It was necessary to associate time with velocity to make it a dimension in meters like all our other three dimensions (Cartesianly speaking). Energy is associated with mass, e.g., kinetic energy = $1/2m{\cdot}v^2$. An energy without mass is the one that defines the Dark Energy, the one that moves the space-time.

The general expansion with the speed-up expansion of space-time around massive bodies of matter guides objects away from each other in a straight radial direction without changes in velocity, consequently forming due space-time shape their elliptical trajectories.

4. Conclusion

Only acceleration causes distortions in space-time, implying that space-time and inertia are inherently linked. So energy, under the control of inertia, causes changes in the shape of space-time.

What about Entropy? It's not clear what entropy should even mean since it's a completely open system.

Space-time flux brings with it in its shape inertia that can be manifested over matter. The phenomenon is known as gravity in classical physics.

The acceleration of the fluid of space-time requires energy. It's worth noting

that mass is not a prerequisite for energy, so gravity's space-time flow can possess energy without needing mass. Therefore, the acceleration of the space-time fluid is required for the normal expansion of space-time as it resides inside the atoms. It includes the primary expansion, all space-time flow motions are radial to the mass object.

Gravity = Space-Time Flow acceleration (Dark energy producing the nozzle effect).

The theory of relativity is simpler than some of its mathematical expressions. All space-time flow motions are permanently radial to the massive object. That is why it is said that analyzing all these phenomena relative to a radial visualization at all times would simplify mathematical notation.

Conflicts of Interest

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

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