



GLOBAL PHYSICS

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LAW OF GLOBAL GRAVITY

*José Tiberius*



*Hobbies: chess, padel and philosophy among others*

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The only antidote for the egocentrism  
of pure reason is Love.

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GLOBAL PHYSICS

VOL.

THE LAW OF GLOBAL GRAVITY





## I. GRAVITATIONAL ENERGY AND MOVEMENT

*Global Physics* is a new theory of everything that covers from the physical medium of gravitational and electromagnetic energies, motion of elementary particles and atom configuration, mass, black holes and stars, **dark energy** and **dark matter**, to proposals about the origin of the universe gathered in *Cosmology*.

*Global Physics* studies the group of physical principles defining matter and its phases in its book *Global Mechanics* and, to some degree, in *Global Astrophysics and Cosmology*. The second group, to which principles about gravitational energy and motion belong, is in the books *Physics and Global Dynamics*, *Law of Global Gravity* and, to some extent, in the hereinabove mentioned *Global Astrophysics and Cosmology*.

The distinction amid physical principles attempts to simplify the explanation of a complex and extensive subject. Besides, it connects to matters laid down in *Quantum Mechanics* and *General Relativity*, sprang from Newton's *Laws of Dynamics* or causes of motion.

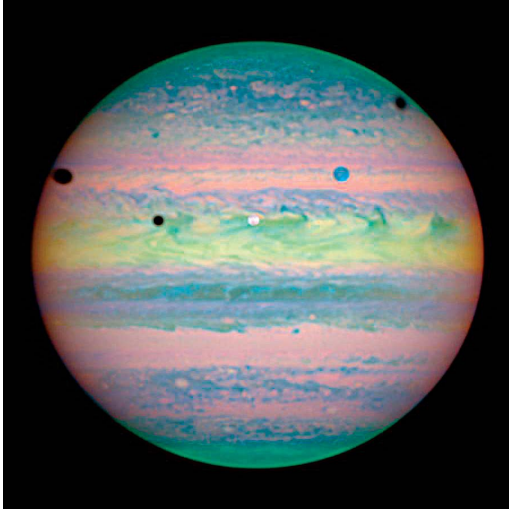
This book about the *Law of Global Gravity* means a deep and penetrating analysis of gravitational energy and motion, as it uses concepts incorporated by other *Global Physics* books.

Among the most relevant concepts, the global aether – reticular structure of matter– as material support for gravity field, the mass and **kinetic energy**, and **luminiferous aether** – gravity field– as supporting medium for electromagnetic energy.

**NASA**

## **Moon shadows in Jupiter**

(Public domain image)



The new *Global Physics* has scientific character despite being an alternative theory to the *Theory of Relativity* and, broadly, to the unique interpretations of *Quantum Mechanics* on gravity and motion on a subatomic scale; And, of course, it presents and proposes possible physical experiments –not thought experiments– to confirm its assertions.

It is also necessary to point out those new concepts with a higher degree of precision, like motion and properties of global aether –*gravitational or kinetic aether*– and *luminiferous aether* requires the use of additional names or terms to achieve terminological clarity and ease assimilation.

Specifically, chapter II of this book describes the connections between Newton's *Law of Universal Gravitation*, changes proposed by the *Theory of Relativity* and the view of *Quantum Mechanics* about the gravitational energy effect on motion.

Chapter II also explains, under the new perspective of *Global Physics*, the effects of gravitational energy on motion through the two components of the *attractis causa*.

Chapter III shows a higher precision on energy concepts, especially about mechanical, potential and kinetic energy. Likewise, the unification of forces and energies proposed by *Global Physics* leads us to make brief descriptions of different types of energy.



The fundamental equation of the new theory of everything relies on a direct relation between acceleration due to gravitational energy on any point of the gravitational field, and the four most prominent physical constants plus a normalization variable \*n\*, that curiously equals one. In other words, it balances dimensions or units in both sides of the equation, because those of the current model of *Modern Physics* are not accurate.

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## **Gravitational Law of Equivalence**

$$\mathbf{g} = [ \mathbf{c}^2 * \mathbf{h} * \mathbf{R} / \mathbf{G} ] * \mathbf{n}$$

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The *Global Gravity Law* deserves special mention for implying an alternative explanation, which is consistent with common sense, of the relevant **predictions of the General Theory of Relativity** of Einstein using a small adjustment of Newton's *Law of Universal Gravitation*.

*Global Physics* explains the three great natural phenomena of *General Relativity* with the **Merlin effect**; we are referring to the effect of the gravitational lens, the **gravitational redshift** of light and the **precession of the perihelion of Mercury** – explained first by Paul Gerber in 1898.

**Global Gravity Law**      $\mathbf{g}_g = \mathbf{G} \frac{\mathbf{M} [1 + \pi \mathbf{v}^2 / \mathbf{c}^2]}{\mathbf{r}^2}$

Chapter IV includes an analysis of the fundamental equation mentioned above, a little discussion on **gravitational waves**, and mathematical calculus elucidating the cited phenomena.

\* \* \*

## 2. GRAVITY AND GRAVITATIONAL ETHER

### 2.a) Newton's law of universal gravitation

Newton integrated force of gravity on Earth with the force that governs planetary orbits through his mathematical *Law of Universal Gravitation*, but he did not give any reasoning of the mechanical causes to support it. Newton himself commented that he did not like forces at a distance.

Subsequently, Einstein's *Theory of Relativity* added a slight distortion of space to fit the planetary orbits to astronomic observations. If the *Law of Universal gravitation* was a purely mathematic law, *General Relativity* uses mathematical equations so complex that not only the physical interpretation is elusive, but also the precise description is imaginary in the majority of cases. A friend from Mensa, the herbivore, upholds Einstein's theories and always had a vivid imagination.

It seems that two different causes would have to exist in the theory of gravitation. One would justify classical gravitational force or Newton's *Law of Universal Gravitation* and, the other, the distortion of the anomalous precession of Mercury's orbit explained by Einstein's *General Relativity* in 1915 with the same formula used by Paul Gerber in 1898.

Mathematically, Newton and Einstein resolved the problem more or less, given that they make possible quantification of energy exchanges, due to the gravitational forces, between kinetic and potential gravitational energy maintaining mechanical energy.

The gravitational interaction is responsible for variations between kinetic and potential elastic energy associated with a mass in the global or **gravitational aether** –reticular structure of the matter– with radial symmetry.

An approximation to the mechanisms of gravitational ether interactions with the bodies with mass and, through **luminiferous ether**, with electromagnetic energy appears in the book *Physics and Global Dynamics*, in the section on *Physics of motion* with an analysis of dynamics of light movement and the bodies with mass in **free fall**.

On the other hand, in this book's section on *Energy experiments*, calculus of light curvature in the gravitational lens and **perihelion precession of Mercury's orbit** are studied.

However, a mathematical formula is one thing, and the underlying physical explanation another. **Atractis causa** topic is intricate due to the existence of two components of gravitational forces. One would explain the acceleration of mass associated with Newton's classic *Law of Universal Gravitation* and, the other one, Einstein's imaginary **space-time** distortion regarding the anomalous precession of the planetary orbits added to *Celestial Mechanics*.

The fact light deflects in a gravitational field precisely double than mass according to Newton's *Law of Universal Gravitation* makes us suspect that there must be some special relationship between the causes of both deviations.

*Global Physics* also resolves the problem of calculating the gravitational force with the *Law of Global Gravity*.

In this formula, global mass does not appear because, doing this would place it on both sides of the mathematical equation, and it would force a reformulation of the equation.

Gravity force between two bodies is also inversely proportional to its distance squared. This formula of gravity acceleration is equal to Newton's *Law of Universal Gravitation* if we take into account the direct effect of velocity on gravitational interaction. Understanding always velocity measured concerning the natural reference system provided by global, gravitational or **kinetic aether**.

$$\text{Global Gravity Law} \quad \mathbf{g}_g = \mathbf{G} \frac{\mathbf{M}[1 + \pi \mathbf{v}^2 / \mathbf{c}^2]}{\mathbf{r}^2}$$

According to the mathematical laws proposed by *Global Physics*, the force of gravity is due to two *attractis causa* components, depending on the following variables.

- **Global mass**

Gravitational force is proportional to total mass, that is, mass at rest plus the mass equivalent to **kinetic energy**.

Increase in force of gravity due to increase in total mass does not affect **Mercury's orbit**, given that bigger force of gravity must accelerate the greater total mass. Consequently, in both formulas –global gravity with only the first component of *attractis causa* and Newton's *Law of Universal Gravitation*– the mass of the body affected by gravity force does not appear; and both results would be identical concerning acceleration.

- **Velocity of body with mass - Merlin Effect**

This second component is half the force of gravity that the kinetic energy of global mass would suffer due to its speed,

which is equivalent to the electromagnetic energy needed to reach the mentioned speed. Remember that **curvature of light** because of gravitational lens effect is double than the deviation of the mass. One part compensates the increase in total mass, and the other makes up this second component of *attractis causa*.

In order to add the equivalent mass of kinetic energy to Newton's *Law of Universal Gravitation* formula it is necessary to correct its value by  $2\pi, 2$  given the double effect of the gravitational interaction of kinetic energy and  $\pi$  due to the character of linear acceleration in the equation above. It is an issue similar to the difference between Planck's constant and reduced Planck constant.

The *Law of Global Gravity* represents energy transfers between the gravitational ether and the mass, and between luminiferous ether and electromagnetic energy; therefore, pertinent magnitudes are always different types of energy; what is more, the mass is a manifestation of accumulated elastic energy.

The second component of *attractis causa* is named **Merlin effect** due to its repercussions on the movement of bodies with mass (Mercury) and the propagation of light (Lighting).

Difference between *Global Physics* and *General Relativity* is that while Einstein uses kinetic energy to alter **space-time** and balance the planetary orbits, *Global Physics* defines an additional force or second component of **attractis causa**, also adjusted by kinetic energy, to explain the physical reality without altering it.

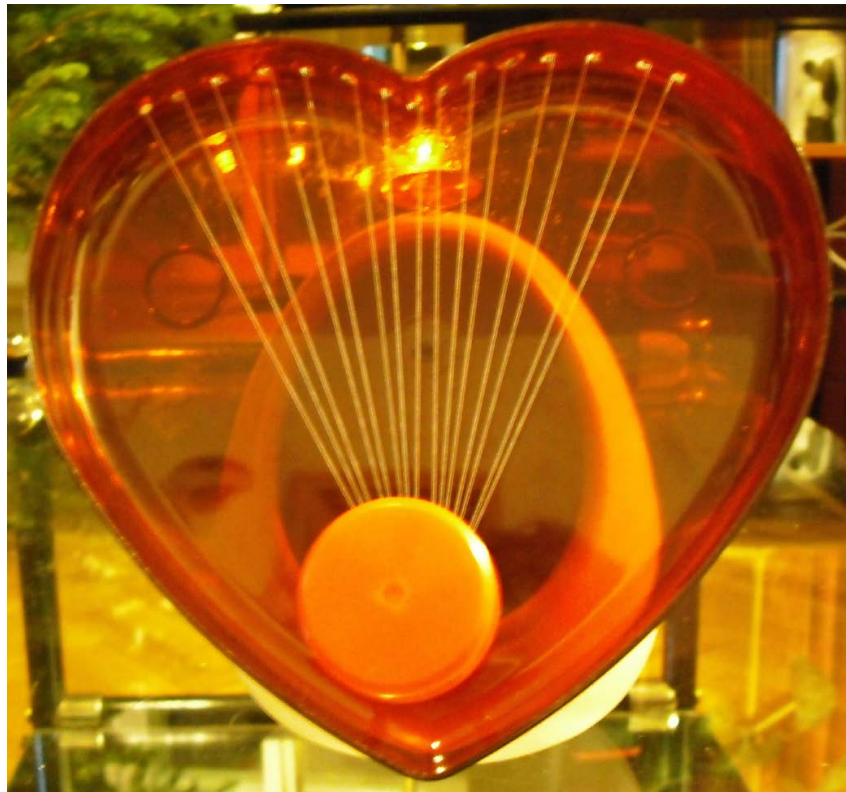
As previously mentioned, Newton was aware that his theory did not explain the mechanical mechanisms of gravity force, what he called forces at a distance. *Modern Physics* not only

does not explain the mechanisms of physical reality providing energy for accelerations in the space-time continuum or, at least, where and when these mechanisms act, but it also casts doubts on the most basic concepts of its *raison d'être*, such as physical reality, space, and time.

*Global Physics* attempts an approximation of said mechanisms through the interaction of gravitational or **kinetic aether** with mass.

## **Force of gravitation**

Bewitched heart



The bewitched heart figure allows for an intuitive understanding of gravity force because of vibrations of the **gravitational aether**. If we make the strings in the heart vibrate, any mass or energy property on them will tend to move upwards –to where the strings are most separate–, on condition that said body has a neutral spatial orientation.

If the object's shape were like a black triangle, it could well

move to the contrary; then its spatial configuration would mean a greater effect on energy exchange than that of spatial configuration of the strings. A more in-depth analysis of motion is in the section on *Physics of movement with gravity* from the book *Physics and Global Dynamics*.

- *Homemade physics experiment*

As a straightforward, but a not exact example, it can show that the additional gravity force due to vibration or movement of the object on the strings would define the Merlin effect, or second component of the attractis causa because it would produce more points of contact and energy exchange.

- *Simple example of the pigeon*

With same limitations of an imperfect example, it is also worth considering the energy exchange of a pigeon flying with or without wind.

Remembering *Global Physics* characteristics of Euclidean space, absolute time and of being renormalizable, we would say that the mechanism of gravitational interaction is the same one for deviation of mass and light curvature. In other words, it is equal to the effects of Newton's *Law of Universal Gravitation* and those of Einstein's *Theory of Relativity* about planet's orbits.

In fact, we are describing the unification of both attractis causa components. In this sense, what changes from one case to another is perspective and quantitative effect of the only existing mechanism.

The question of mass spatial configuration in gravitational interaction is significant since it allows a more precise explanation of other concepts that are now, due to so much



relativity and uncertainty, somewhat confused, such as those of motion, force, time, space and velocity.

Moreover, both *Law of Global Gravity* and Newton's *Law of Universal Gravitation* not only can appear regarding energy instead of mass, but it would be more suitable. After all, the chosen units do not alter the outcome, as an example, one can refer to the field equations of Einstein's *General Relativity*, with its conversion to geometric units.

The *attractis causa* components will be examined in more depth when discussing the motion, *kinetic energy* and the *Laws of Global Gravity* themselves; taking into account the nature of light and mass according to *Global Mechanics*.



## 2.b) Gravitational Law of Equivalence

### 2.b.1 Force and gravitational field

The concept of gravitation in *Classical Physics* is a strange notion. As it is unknown what gravity is, one resorts to the trick of defining a gravitational field with particular properties, which correspond to the visible effects of gravitational force or other gravitational processes.

This model is useful, but we must not forget that it is a temporary solution until the discovery of the true nature of gravity.

On the other hand, science is getting closer to realize the nature of the gravitational field and to be able to create a sound model as an alternative to Einstein's *Theory of Relativity*.

A more complete gravitational field concept must take into account gravity-energy-mass equivalence, a very descriptive but quite imprecise term.

In any case, the gravitational field cannot be a set of points in space with properties assigned by a *Divine Being* or particles that emerge from the *Divine Nothing* by Heisenberg's Uncertainty Principle or Indetermination Principle; at least, not from a scientific point of view. Newton said so when stating that he did not like forces at a distance while formulating the *Law of Universal Gravitation*.

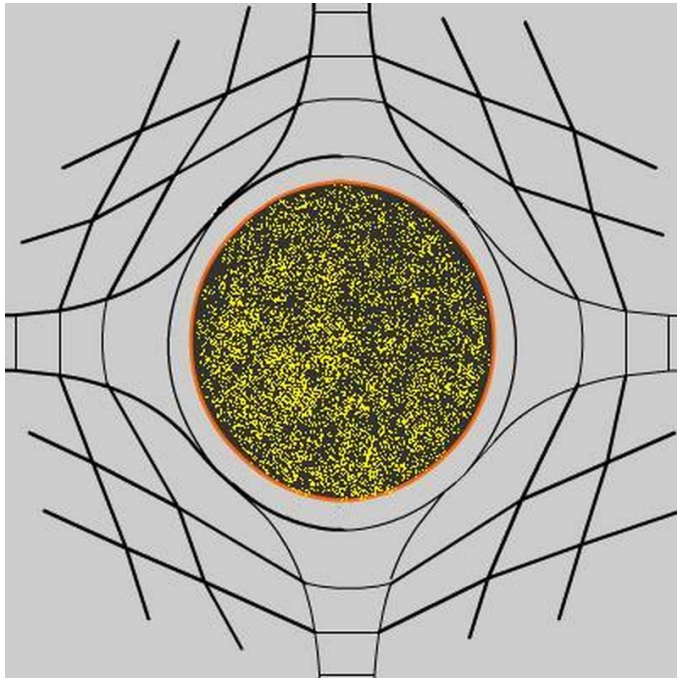
From a philosophical perspective, as much the Conservation of Energy Principle as the Global Conservation Principle come to the same conclusion; that is to say, that things neither appear nor disappear into the nothingness. It is the same if we are talking about processes regarding matter, mass,

electromagnetic energy or energy from a gravitational field.

To the common element of matter as a physical reality that remains in all its states of aggregation and supports all their properties, like electromagnetic energy or strong and weak nuclear energy, and which cannot be abstract, is what *Global Physics* name as gravitational aether, **kinetic aether** or **global aether**.

### **Gravitational aether**

State of physical matter



Something similar exists in *String Theory* regarding minute particles which form part of the remaining current fundamental particles; but, and sorry to put it so bluntly, the existence of more than three physical spatial dimensions sounds to us like a fairy tale. Maybe it is language's shortcoming or the desire to confuse nonprofessionals –We

wonder why! Another difference is that the *Global Physics* is an alternative theory of Einstein's *General Relativity*, so far from integrating it, what it does is highlight its almost complete incorrection.

The new gravitational theory tries to change or help to improve the current paradigm of Modern Physics in the main aspects of relationships between energy and mass with the **gravitational aether**. In particular, proposing the new *Gravitational Law of Equivalence*, explaining the exact scope and

significance of energy-mass equivalence, and eliminating certain philosophical-quantum relaxation which has taken over scientific method during the last century –not only in *Modern Physics*.

## ■ **Gravitational Law of Equivalence**

*Global Physics* centers in the **Global Conservation Principle**, in its fundamental equation or *Gravitational Law of Equivalence* and some philosophical hypotheses such as the following:

- *Physical reality does not depend on the observer, only its perception, and description.*
- *Time is relative from life's subjective point of view, but this aspect is irrelevant in the field of objective or conventional physics.*
- *A scientific theory is good if it is useful, but it is much better if once understood, it also has common sense.*

So severe was the problem that arose from Einstein's *Theory of Relativity* in its day that the philosophy of science itself had to change. From the considerations of the famous Vienna Circle everything goes in science, it does not matter if it is reasonable or not, it is enough that it is useful and proven with experiments. For example, an object can be various things at a time depending on who is looking at it, or it can be in two different places at a time –we wonder how one could prove that!

Although they do belong to the philosophy of science, these hypotheses are significant because it is necessary to give a new direction to some aspects of current opinion. The idea is to make it less utilitarian –

appropriate to technology– and more logical –suitable for science.

The book on *Global Mechanics* includes a chapter on *physical principles* and its scientific and innovative nature.

In the book on *Global Scientific Method*, there is a section on the *Method of scientific research* in *Modern Physics*.

*Global Physics* is, at its root, a scientific theory; but it does not try to go into excessive mathematical technical detail, especially those derived from the latest technological advances and the more than risky explanations that sometimes offers the scientific orthodoxy.

Suffice to say that this book on the new **gravitational aether** and the *Physics and Global Dynamics* book belonged to the last section of the book on the *Equation of Love*. Also, the said chapter, in the first edition of November 2003, had the name *Towards a new theory*, because the approach had neither name nor defined content and the *Gravitational Law of Equivalence* was under the name *Gravity Riddle*.

*Global Physics*' fundamental equation is the *Gravitational Law of Equivalence*. It is an equation relating physics' basic constants to gravity on the Earth's surface –most common physical variable–, that is to say:

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### **Gravitational Law of Equivalence**

$$\mathbf{g} = [ \mathbf{c}^2 * \mathbf{h} * \mathbf{R} / \mathbf{G} ] * \mathbf{n}$$

---

Here, all constants are familiar except **n**, which is a variable of dimensional normalization with equal value one. In fact, dimensions of **n** indicate that other variables have not the correct dimensions, given that they do not convey all

physical dependencies regarding the gravitational aether, speed, mass, and energy.

Additional comments on the *Gravitational Law of Equivalence* appear in the chapter on *Energy Experiments* of this book in the section discussing the **GigaChron** Experiment.

$$\mathbf{G} * \mathbf{g} = \mathbf{c}^2 * \mathbf{h} * \mathbf{R}_H * \mathbf{n}_d$$

This gravitational equation should help the correct configuration of physical magnitudes and their precise quantification; in particular, quantifying the relationship between the intensity of gravity field, supported by the **gravitational aether**, and the speed of light.

In the book *Global Physics Experiments* there is also a section dedicated to this relationship between physical constants, including Universal Gravitational Constant and variable force of gravity per unit of mass \*g\* for the specific case of the Earth's surface. Which, in turn, leads us to another presentation or formulation of the *Gravitational Law of Equivalence*.

---

## Gravitational Law of Equivalence

$$\mathbf{g} = [ \mathbf{E} \mathbf{c} / \mathbf{G} ] * \mathbf{n}_d$$

---

The formula shows us the quantitative equivalence between the intensity of the gravitational field, the speed of light, and the electromagnetic energy generated at a point in the gravitational aether.

On the other hand, the objective of the book *Global Mechanics* is the application of philosophical principles and the fundamental equation from *Global Physics* to study the structure of matter and other aspects regarding Particle

Physics or High Energy Physics.

Development of *Global Physics* provided by *Global Mechanics* has improved the understanding of many concepts on force and the gravitational field, which has allowed the modification or fine-tuning of *Newton's Laws of Inertia, Force, and Action and Reaction*.

Moreover, slightly correcting Newton's *Law of Universal Gravitation* provides us with an alternative formula of gravity.

$$\text{Global Gravity Law} \quad \mathbf{g}_g = \mathbf{G} \frac{\mathbf{M}[1 + \pi \mathbf{v}^2 / \mathbf{c}^2]}{\mathbf{r}^2}$$

The section on *Energy Experiments* also includes the quantitative verification of the Merlin effect –the second component of the attractis causa– from the *Law of Global Gravity* and some considerations on following natural phenomena related with the *gravitational aether* or global aether.

- *Gravitational waves*
- *Gravitational lenses*
- *The perihelion precession of Mercury*
- *Redshift and other gravitational processes*
- *Gravity Probe B*







## 2.b.2 Global Conservation Principle

The new physics model uses the *Global Conservation Principle* to two ends. On the one hand, to show the possibility of changing the state of aggregation of the **global, kinetic or gravitational ether** –reticular structure of matter– or altering a physical property. On the other hand, that there will always be a relationship of equivalence between sub-reticular units or new properties of matter that we could discover.

- *There exists conservation of matter in transformations or equivalence between different manifestations of a basic universal element, which we will call global aether.*

The conservation of matter law or principle in its broadest sense or global equivalence is very generic, but it explains perfectly the essence of *Global Physics*. Not only there is a transformation between the potential gravitational energy, electromagnetic energy, **kinetic energy**, and mass, but also they are different manifestations of the gravitational ether –elastics energy.

The fact that gravity field is the **luminiferous ether** does not invalidate the previous affirmation.

- *Water example*

Ice, water and steam and other physical states of matter

- *String example*

Another beautiful example is that of cotton, string and a ball of cotton respectively.

*Global Mechanics* model indicates that filaments of the gravitational ether are unbreakable, and they spread across the whole universe. This model tries to establish the physical limits among the diverse manifestations of matter and the mechanisms involved.

The unbreakable and elastic character of the gravitational ether aids the intuitive notion of the **Global Conservation Principle**.

When presenting a scientific paradigm shift, there arises a serious problem regarding the terminology to explain new concepts. With similar or same terms of the current paradigm, the new ideas are not precise enough, and the new names have not force until the brain internalizes them.

For example, there are problems when defining matter; you only need to look at Wikipedia to see that the English version of the article partly contradicts the Spanish version.

From the concept of matter on Wikipedia in Spanish: “In Physics, matter is the name given to any physical entity, which is part of the observable universe, it has energy and is capable of interacting with a measuring device, or in other words, it is measurable.” The principle should be the *Principle of Matter Conservation*, but it would be unclear its meaning. Also, the term Principle of Global Conservation refers to the theory that it accompanies, and to the unbreakable and elastic filaments of the global or **gravitational aether**.

The Principle of Global Conservation means a step further on in modern science from Lavoisier’s initial Law of Matter Conservation, from the Principle of Energy Conservation in *Classical Mechanics* or energy-mass in *Relativistic Mechanics*, with the addition of the gravitational ether, which supports gravity, mass, and kinetic energy.

Therefore, known transformations, equivalences and conservations of matter, and other gravitational processes are covered, such as:

- **Doppler effect of light**

With *Principle of Global Conservation*, we can deduce the Doppler effect of light, as this fact implies an energy equivalence between the variation of the frequency of light and relative speed in the Galilean sense when it differs from the speed of light.

The Doppler effect of light appears again in section *Energy experiments*.

- **Redshift**

If in the **Doppler effect** the changes in energy or light frequency depend on relative movement and its corresponding energy, when changes in energy relate to changes in the intensity of the gravitational field, the process is redshift or blue shift. The expression redshift usually refers to the **gravitational redshift**.

Changes in the frequency of electromagnetic waves with gravitational variation imply equivalence between electromagnetic energy and **potential energy** that are within the concept of the Global Conservation Principle.

The section on *Energy experiments* studies this equivalence of **gravitational redshift** within the non-relativistic or alternative explanation to Einstein's *General Relativity*.

- **Processes related to matter and energy conservation in Particle Physics.**

The equation of the *Gravitational Law of Equivalence* from the new theory has repercussions, among other things, in

the definition of **physical mass** and the atomic configuration. It affects Bohr's postulates, and the atomic structure of Schrödinger's model –current model according to Wikipedia–, about the sensitivity of the gravito-magnetic field of electron orbits.

The book *Global Mechanics* presents a new atomic model along with comments on main lines making up molecular bonds.

- **Matter conservation processes and energy regarding Astrophysics**

The book *Global Astrophysics and Cosmology* presents the nature of black holes and stars, as well as various innovative ideas regarding **dark matter**

and **dark energy**, based on matter conservation due to the unbreakable and elastic filaments of the gravitational ether.

This new Global Conservation Principle is much more general than conservation principle of relativistic energy-mass together with established Einstein's Equivalence Principle of General Relativity, although it does not imply any transformation of time, intrinsic size of space, or any unknown dimension.

It is not the same saying gravity deforms space that the

**Galaxies in collision**  
**NASA and**  
**STScI-Hubble Team**  
(Public domain image)



gravitational field ~~–luminiferous aether–~~ may spin and that it may entirely drag electromagnetic energy. The Vinyl-Disc experiment shows this difference.

Although forces in gravitational fields –tension of longitudinal curvature of the gravitational ether– are additive and can cancel each other out, there are other gravitational energy effects of these fields. Some properties like the longitudinal tension of the gravitational ether, or the pressure inside of planets do not cancel out. That is to say, nothing disappears or appears from the nothingness.





## 2.c) The Laws of Global Gravity

The *Laws of Global Gravity* incorporate new characteristics to Newton's *Universal Gravitational Law*. They add some nuances which, though they are quantitatively speaking rather small, are important from a conceptual point of view.

These laws theory allow explaining the natural phenomena of the **predictions** made in Einstein's *General Relativity*, without altering concepts of time and space, and without using any additional dimension.

Within the gravitation theory, the *Global Law of Gravity* is part of the new paradigm or model of physical reality proposed by *Global Physics*.

Global has been the chosen term due to the need to perform an analysis covering the different types of states of matter, forces, and **types of movements**. Besides, we picked it, in spite of its abundant and extended use, to ease the brain placing itself within the new perspective advocated by *Global Physics*.

Section *Principles of Physics* in the *Global Mechanics* book presents the general characteristics of the new model.

Among said characteristics, it is useful to highlight new concepts provided by *Global Mechanics* about the reticular structure of matter –**kinetic, gravitational or global aether**– as the supporting medium of the gravitational field, **kinetic energy** and mass, which justify the *Principle of Global Conservation* or gravity-energy-mass equivalence.

Also, gravity field is the **luminiferous ether** or supporting medium for electromagnetic energy.

The characteristic of **gravitational aether** of being a physical medium entails the necessity of taking into account the velocities concerning the natural reference system of the masses and energies in gravitational interaction. Although, without forgetting the particular case of electromagnetic energy and its luminiferous ether.

The *Laws of Global Gravity* are a simple mathematical formula, which collects implications of the **Merlin effect** –second component of the attractis causa on Newton's *Gravity Law*.

The previous section about Newton's *Universal Gravitational Law* introduced the *Global Law of Gravity* and the two components of the attractis causa; one referring to Newton's gravitation and the other to *Global Physics* with its Merlin effect.

$$\text{Global Gravity Law} \quad \mathbf{g}_g = \mathbf{G} \frac{\mathbf{M} [1 + \pi \mathbf{v}^2 / \mathbf{c}^2]}{\mathbf{r}^2}$$

The innovation consists of the Merlin effect or additional force caused by speed. Given that reference speed \***v**\* is the one of the global mass, not the one of electromagnetic energy, quantification involves the mass equivalent to kinetic energy. This effect is equal to **kinetic energy** [ $\frac{1}{2} m_0 v^2$ ] multiplied by [**2π**] to take into account linear motion and the double gravitational interaction of energy and divided by [**c<sup>2</sup>**] due to the famous **mass-energy** equivalence [**E = mc<sup>2</sup>**] –original formula of Olinto de Pretto.

Besides, in the book *Physics and Global Dynamics*, the characteristics of acceleration, force, and motion through global aether with theoretical total symmetry or with radial

symmetry –gravitational ether– have been studied.

Another noteworthy element of the *Law of Global Gravity* is that energy contribution of gravity field not only affects kinetic energy; it can also affect other manifestations or types of energy.

A famous particular case is a variation in the frequency of electromagnetic energy in **gravitational redshift**.

In order to include all energy transformations, we should use the fundamental equation of *Global Physics*, which is the following one.

The book *Theory of Relativity, Elements, and Criticism* briefly

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**Gravitational Law of Equivalence**

$$\mathbf{g} = [ \mathbf{c}^2 * \mathbf{h} * \mathbf{R} / \mathbf{G} ] * \mathbf{n}$$

---

explains famous **predictions of General Relativity**. In following pages, *Global Physics*, using the *Law of Global Gravity* formula, leads us to a justification of same natural phenomena in a simpler way, without altering concepts of time and space.

Nevertheless, before plunging into calculus, it is advisable to understand the causes of gravitational forces taking part in the following cases:

- **Gravitational theory of mass in Newton's Law of Universal Gravitation**

Without taking into account speed of the mass, the *Global Law of Gravity* coincides with Newton's *Law of Universal Gravitation*.

In *Global Mechanics*, mass creates through three-dimensional loops and curls of global ether due to its

transverse elasticity and torsion energy. Mass is a high accumulator of the energy of reversible deformation. In short, mass is a new state of aggregation of the global ether in continuous synchronization with the longitudinal vibration of global or kinetic aether.

In the new gravitational model, this synchronized vibration of mass and gravitational ether is the mechanism for transmission of **potential energy** from the gravitational ether to the mass, causing its gravitational acceleration.

Due to radial symmetry of the gravitational ether, resultant of gravitational force directs towards the mass responsible for the gravity field.

Neutron impulse produced by the **kinetic aether** mechanism should have same unit vector component for each spatial point; in other words, the direction of gravitational force is independent of whether the neutron moves towards the center of the gravitational field, away from it, or in a circular orbit. In the first case, the acceleration due to gravity shall occur, in the second one, a negative gravitational acceleration, and in the third one, a centripetal acceleration.

The force from Newton's *Law of Gravity* is proportional to the mass; the example with the neutron is just a symbolic one. Since it is an uncharged particle, there is no need to simplify not taking into account **electromagnetic fields**.

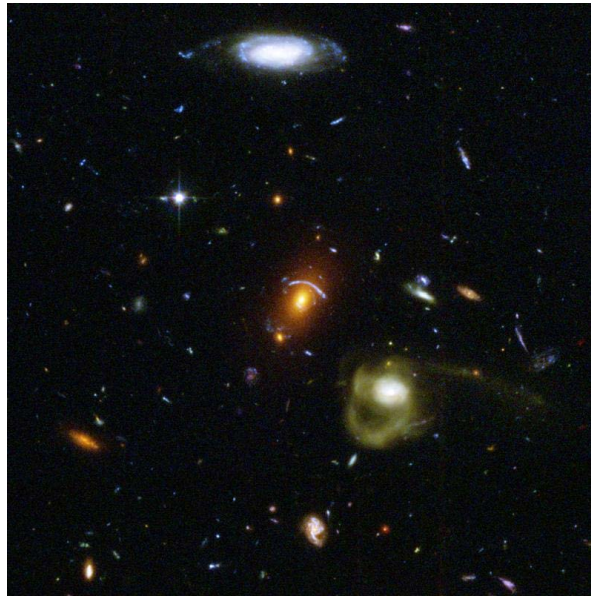
Nevertheless, we should not forget that mass is a new state of aggregation of the **gravitational aether** with specific energy properties. In fact, said properties cause the gravitational effects. An interesting aspect is that the proportionality above derives from the fact that crucial

units –neutrons and protons– configure the mass; leaving the discussion about gravity caused by black holes or other outer-space phenomena aside.

## **Galaxies and laws of gravity**

**NASA**

(Public domain image)



In any case, we are dealing in this section with consequences of the gravitational field on the mass, not with the mass as the cause of said field.

Einstein's *Theory of General Relativity* also approaches the concept of gravity force caused by energy; the only problem is that the explanation is not very clear. It is not possible to explain it since he mixes science and magic when he stretches time, space and all derived quantities. There appear too many mathematical tensions without knowing how to interpret or correct them.

The *Theory of General Relativity* accurately indicates that mass and electromagnetic energy are two energy manifestations, but it entirely fails when it denies the reticular structure of matter, which is, precisely, the material subject of said

manifestations.

■ **Gravitational theory of light or electromagnetic energy**

In *Global Mechanics*, light or electromagnetic energy is a transverse wave of a mechanical nature in the reticular structure of matter, which constitutes global aether and supports the force of gravity.

However, it is a bit more complicated than that; we must bear in mind that gravity field is also the supporting medium for electromagnetic energy or **luminiferous aether**. In other words, global aether is the material support for luminiferous aether, which acts as an intermedium energy support of electromagnetic energy.

Also, we must take into account that luminiferous ether – gravity field– is a dynamic property of the global aether.

In short, light is another manifestation of the elasticity of global aether as a reversible energy property; since, when the light wave passes, global aether returns to its previous state.

As electromagnetic energy and mass are two different manifestations of elastic energy of the global or gravitational ether, they have the same interaction or exchange energy mechanism with it –related to the synchronization with its longitudinal vibration. Consequently, electromagnetic energy will have a similar effect as the mass with Newton's *Law of Gravity*, or more appropriately, instead of on the reversible deformation energy represented by the mass.

Simultaneously, because of the speed of light, similar interrelation will occur again in equal quantity, since the speed of propagation of electromagnetic energy –

transversal waves— is the same speed of transmission of longitudinal tension, as is discussed in the section on the characteristics of **gravitational waves**.

We are not dealing with particular mechanisms generating elasticities in depth. We are just providing a brief description of the elastocytes, as they would be part of a theory of the internal structure of the reticular filaments. It has not been necessary for the presented gravitational theory and, besides, we do not have enough empirical information to do so.

Nevertheless, we would like to note that the double gravitational interaction in the case of electromagnetic energy or the movement of mass takes place in the elementary units of vibration or elastocytes. The characteristic is because of the energy exchange is not proportional to traveled space. In other words, it is as if, with speed, the longitudinal and transverse vibrations of an elastocyte coincided more and a higher energy exchange per unit of covered space occurs.

Mathematically, the formula for the *Law of Global Gravity* also resolves the calculus of deviation of light or gravitational lens effect. To do so, one must bear in mind that the second component or component of **kinetic energy** is the addition of a geometric progression of smaller and smaller elements and that it can be resolved using Taylor's theorem. Consequently, the sum for the case of velocity  $v$  equal to  $c$  is 1.

#### ■ **Gravitational theory of the kinetic energy**

With motion, mass vibration will increase to keep synchronization with the longitudinal vibration of kinetic or **global aether**. In short, the interrelation with global or

gravitational ether by a unit of absolute time will increase, and a more significant effect of the same mechanism of the gravitational interaction will occur.

The gravitational interaction occurs, on the one hand, due to the radial symmetry of gravitational ether that will tell us direction and sense of resultant force. On the other hand, it will also be due to the elastic energy transfer between the longitudinal curvature tension of gravitational ether and the mass –just in case; we are talking about the other mass, not about the mass generating the field of gravity. However, said transfer would be higher if more internal contact occurs, as with the previous case of electromagnetic energy.

Moreover, in this case, as it is the said material mechanism, the acceleration shall be proportional to the central mass, shall have the same vector component and shall still be inversely proportional to the squared distance, but with an additional proportionality factor. This factor will be the kinetic energy.

The additional gravitational force due to the global mass' **kinetic energy** at a velocity  $*v*$  shall be equal to the gravitational force that the equivalent electromagnetic energy would suffer, that is, twice the mass in Newton's *Law of Gravity*. From the perspective of the kinetic mass – the mass equivalent to the kinetic energy– will have two times the gravitational attraction than the mass at rest.

Half this quantity will not affect motion due to inertial proportionality factor between mass and acceleration, taking into account there is an increase in the global mass due to velocity. The other half will be responsible for the spatial deviations regarding Newton's *Law of Gravity*.



Quantification of this effect on global acceleration appears in the second component of the previously mentioned *Global Gravity Law* formula. The meticulous calculus of the **anomalous precession of the orbit of Mercury** and rest of the planets with this theoretical gravity formula is in section *Energy Experiments*.

We would like to remark that both *Global Physics* and *General Relativity* use the same formula than Paul Gerber used in 1898.

Einstein's *General Relativity* also makes use of **kinetic energy** in his field equations to distort space and to adjust the anomalous precession of the orbit of Mercury.

\* \* \*



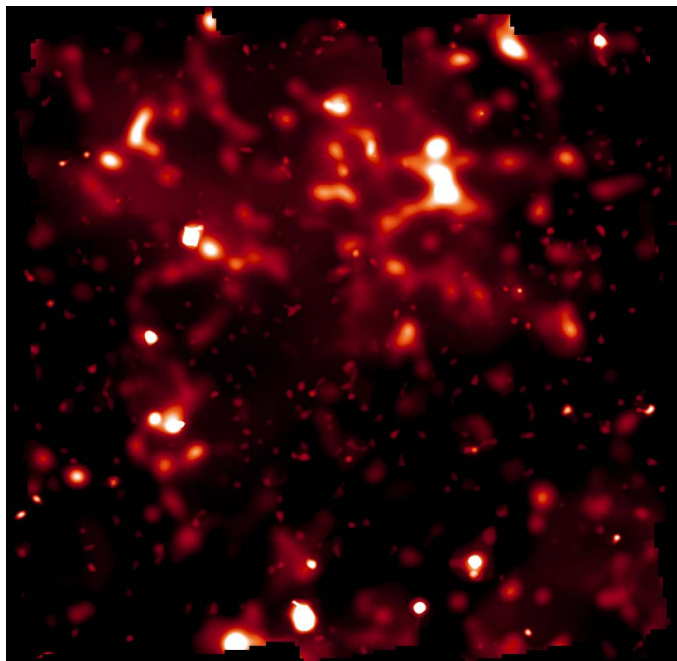
### 3. ENERGY

#### 3.a) Definition and concept of energy

The definition of force that we have adopted is *the manifestation at a point in the space of energy*, that is, force is energy wherever it expresses. The problem of this definition is that concept of force now depends on the definition of energy.

According to Wikipedia, in Physics, the definition of energy is the ability to do **work**. \* Besides, there are several definitions of energy depending on different branches of *Classical Physics*, *Relativistic Physics* or *Quantum Mechanics*.

#### **Visible baryonic matter - NASA** (Public domain image)



We agree with Wikipedia about an important issue when it says energy is neither an intangible substance nor a real physical system, but a property of said physical systems. The problem with modern science is that classical definitions do not

fit entirely with advancements of scientific knowledge, and since an alternative model does not exist, they end up distorted.

Within a context in which new dimensions appear and reality depends on the observer, it is difficult for us to distinguish physical systems from abstract, imaginary or even psychological ones.

In order to clarify the concept, we may say that energy is a property of the reticular structure of matter –**kinetic, gravitational or global aether.**

Another aspect we like is Wikipedia pointing out that different meaning, ideas or definitions of energy relate to the ability to produce motion.

According to *Global Physics*, an appropriate definition of energy will be precisely the ability to produce motion. First, it does not move the problem to another concept, like the less intuitive definition of work. Secondly, both new energy concept and its manifestation at a point or force are close to the concept of movement.

If force is manifestation at a point of energy, the sum of forces throughout the different points of a displacement will be precisely energy, which coincides with the definition of work in physics. Thus, the concept of work will be a manifestation of energy that has generated a displacement of global aether, or displacement of one of its qualities or properties, which may produce movement.

The aim is to achieve a general definition of energy, even though it might modulate for particular cases, to avoid changing the concept of energy when the physical model is not limited to the surface of the Earth, the Solar System or bodies with mass; to mention a few examples.

Nevertheless, new energy definition is not exempt from problems; since it relates to motion, it needs to adapt to each

type of motion in *Global Physics*. In the following section, we will examine the types of energy to verify if persists the idea that energy does not create or destroy, only transforms.

After that, we will go into the analysis of **kinetic energy**, gravitational **potential energy** and mechanical energy in depth, taking into account the **Merlin effect**.

Main problem of energy concept is its physical dimensions; we consider that

---

$$\text{Energy} = \text{mass} * \text{acceleration} * \text{space}$$
$$[ \epsilon ]$$

---

necessary energy to keep acceleration of a mass throughout space depends on the initial situation and on the spatial orientation of movement regarding the natural reference system.

In other words, current dimensions of energy do not allow defining a single or objective unit of energy. Current dimensions should include the physical context. At least, said context should contain the gravity and velocity conditions or, even better, a physical situation at rest within its natural or privileged **frame of reference**.

It is somehow similar to the concept of time. The **definition of second**, as the unit of time, is relative since gravity and velocity conditions of cesium atom can differ.

*Global Physics* did not highlight this issue. Earlier in time, Einstein showed that *Newton's Second Law* or *Force Law* was not exact in regards to **relativistic mass**. However, *Special Relativity* far from resolving the problem makes it worse. Instead of establishing a privileged system, it does the opposite: denies the existence of a privileged frame of reference while setting it, without recognizing, with his *General Relativity*.

Likewise, *General Relativity*, instead of bringing a unit to energy

definition, destroys all objective units of the International System of Units (SI).

Using the example of the puzzle again, we would say that, if the physical reality had a three-dimensional egg-shaped, the *General Relativity* would achieve to make it look like a cube with continuous transformations of units of almost all magnitudes. On the one hand, the axiom of the constant and maximum speed of light reduces one dimension, but when making relative space and time units add two physical dimensions.

It is better not to imagine the impact on the definition of energy if the mass depends on the observer and if space and time are relative. *General Relativity* will possibly achieve some pieces of the puzzle, but with artificially altered pieces, it will be impossible to complete, and visible part of the puzzle will have some distortion.

The other big branch of *Modern Physics*, *Quantum Mechanics* like a bit too many probabilities, additional dimensions and time traveling to modulate the pieces, and try to solve the puzzle. Moreover, if any of the pieces are too strange, they could send them to the parallel world.

The result of a physical model using inadequate concepts of essential magnitudes, such as energy, is the unfeasibility to complete the puzzle, and some parts of the model will be incompatible with each other. At least, that will be the case of *General Relativity* and *Quantum Mechanics*.







### 3.b) Types of energy

The classical idea that energy neither can appear nor disappear only transforms is more an epistemological principle than a physical one. In fact, this characteristic of types of energy can apply to all physical reality, unless we accept matter can transform into nothing and vice versa.

For example, *Principle of Energy Conservation* is consistent with what we already know from the equation of equivalence between mass and energy, that electromagnetic waves are a violation of the *law of conservation of mass*. However, we need conceptual corrections about the meanings of equivalence, mass, and energy.

We can redirect principles of conservation of energy, matter, and mass to a single and more general principle, the **Principle of Global Conservation**.

Energy concept within *Global Physics* new perspective imply types of energy according to their supporting medium –**global ether** and **luminiferous ether**– and the **types of movements** described in the book *Physics and Global Dynamics* in its corresponding section.

# Types of energy

## Motion of global aether

### Types of energy

Types of movement <i>Motion of global aether</i>	Types of energy Global Physics	Types of energy Modern Physics
<ul style="list-style-type: none"> <li>• Reticular expansion and contraction                             <ul style="list-style-type: none"> <li>◦ Little Bang.</li> <li>◦ Separation and approach of stars</li> <li>◦ Creation and dissolution of electrons</li> <li>◦ Creation of mass (compaction)</li> <li>◦ Creation of mass (confinement)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Elastic energy (Black and white interactions)</li> </ul>	<ul style="list-style-type: none"> <li>• Unknown                             <ul style="list-style-type: none"> <li>◦ Big Bang explosion (Theory of Inflation of the universe)</li> <li>◦ Dark energy (Universe expansion and contraction)</li> <li>◦ Electromagnetic energy (Unexplained tunnel effect)</li> <li>◦ Energy emergentism</li> <li>◦ Strong color force</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Longitudinal vibration of global aether (Cause of the internal resonance of particles with mass)</li> </ul>	<ul style="list-style-type: none"> <li>• Longitudinal elastic energy</li> </ul>	<ul style="list-style-type: none"> <li>• Gravitational potential energy (Field of fictitious forces)</li> </ul>
<ul style="list-style-type: none"> <li>• Movement of the gravito-magnetic field (Cause of electron's orbits)</li> </ul>	<ul style="list-style-type: none"> <li>• Electromagnetic field relaxation</li> </ul>	<ul style="list-style-type: none"> <li>• Uncertainty principle</li> </ul>
<ul style="list-style-type: none"> <li>• Variation in the tension of the longitudinal curvature of global aether.</li> </ul>	<ul style="list-style-type: none"> <li>• Gravitational energy</li> </ul>	<ul style="list-style-type: none"> <li>• Space-time effect</li> </ul>

## Types of energy

Types of movement <i>Propagation of light</i>	Types of energy Global Physics	Types of energy Modern Physics
<ul style="list-style-type: none"> <li>• Total drag of light</li> </ul>	<ul style="list-style-type: none"> <li>• Luminiferous aether</li> </ul>	<ul style="list-style-type: none"> <li>• Time effect</li> </ul>
<ul style="list-style-type: none"> <li>• Movement of mechanical wave</li> </ul>	<ul style="list-style-type: none"> <li>• Transverse elastic energy</li> </ul>	<ul style="list-style-type: none"> <li>• Electromagnetic energy (Non-mass through nothing)</li> </ul>
<ul style="list-style-type: none"> <li>• Light curve</li> </ul>	<ul style="list-style-type: none"> <li>• Global gravitational force (Newton+ Merlin effect)</li> </ul>	<ul style="list-style-type: none"> <li>• Geometric effect (Geodesics)</li> </ul>

Types of movement <i>The motion of mass</i>	Types of energy Global Physics	Types of energy Modern Physics
<ul style="list-style-type: none"> <li>• The dance of the wavons (Globudesics) Vibration of atomic nucleus</li> </ul>	<ul style="list-style-type: none"> <li>• Electromagnetic field relaxation</li> </ul>	<ul style="list-style-type: none"> <li>• Uncertainty principle (Heat energy)</li> </ul>
<ul style="list-style-type: none"> <li>• Greek movement or normal motion</li> </ul>	<ul style="list-style-type: none"> <li>• Kinetic energy</li> </ul>	<ul style="list-style-type: none"> <li>• Kinetic energy</li> </ul>
<ul style="list-style-type: none"> <li>• Anomalous precession of the orbits of the planets</li> </ul>	<ul style="list-style-type: none"> <li>• Additional gravitational force (Merlin effect)</li> </ul>	<ul style="list-style-type: none"> <li>• Space dilatation-contraction</li> </ul>
<ul style="list-style-type: none"> <li>• Partial drag of mass</li> </ul>	<ul style="list-style-type: none"> <li>• Kinetic or global aether (Inverse movement)</li> </ul>	<ul style="list-style-type: none"> <li>• Dark energy</li> </ul>

We have tried to present the most significant types of energy. In fact, some types of energy repeat many times because we have kept the classification of types of motion to show the whole model.

As can be seen above, four different types of reticular energy exist so far:

- 
- Longitudinal elastic tension energy
  - Longitudinal curvature elastic energy
  - Transverse elastic tension energy
  - Reversible deformation elastic energy by loops and the compression of global aether
- 

*Global Mechanics* explains how transverse energy transforms into the tension of the longitudinal curvature and reversible deformation energy by compaction and compression of global or gravitational ether when transforming from electromagnetic energy to mass, and vice versa. Elastic energy of **global ether** would be the primary or essential energy from which the rest could derive.

The phase of global ether in which **kinetic energy** exists is mass, not only increasing it but also changing its spatial configuration. We could say that provides a spheroid shape causing mass motion through its interaction with global or kinetic ether, as explained in the book *Physics and Global Dynamics*.

In any case, there are small details of this model, which we can renormalize; that is, we can change without affecting the performance of the model.

Weak and strong nuclear interactions are not on the table since we consider them similar to the gravito-magnetic energy

of the atom. Likewise, chemical energy would be similar to the gravito-magnetic energy of the atom, but at a molecular level.

## **Orion Nebula, Messier 42**

(NASA-Hubble-Spitzer)

(Public domain image)



Another exciting and somewhat risky aspect is the configuration of heat energy as electromagnetic energy – transversal energy– that does not relax with the appearance and disappearance of electrons and causes movement of electrons along their orbits and swinging movement of the nucleus of the atom and molecules.

In general, when heat energy rises, the dance of **wavons** also increases, as well as, in some cases, the emitted electromagnetic energy, just as in storms. In other cases, the rise of **kinetic energy** or speed of the molecules of gases occurs, depending on the ease of conversion from one type of energy to another.

Once the model is complete, covering the reticular structure of matter and the elementary particles to stars and black holes, we can observe its dynamic balance. Its parts come from transformations of one type of energy into another or, in other words, variations of elastic or energy properties of the global ether also called kinetic or gravitational ether.

Let us remind that **luminiferous ether** –gravity field– is a dynamic property of the global ether.



### 3.b.1. Definition of kinetic energy in Physics

The **Global Conservation Principle** covers the mass and energy conservation principle, the **mass-energy** relativistic transformation –with the appropriate precisions and reminding this formula is initially from Olinto de Pretto–, and its quantitative relationship which as we know it occurs in atomic bombs.

—————  $E = m c^2$  —————  
As always, if someone is looking for a more conventional approach of physics of motion we recommend visiting Wikipedia.

Another example in physics of the mass-energy transformation is kinetic energy, which is continuously varying everywhere.

In new model o *Global Physics*, kinetic energy exists in the form of mass; it represents a physical mechanism of equivalence between electromagnetic energy and the mass.

However, it is a distinctive mass, increasing the mass at rest and changing the spatial configuration of the whole mass, so it provokes movement due to the interaction between the global mass and the reticular structure of matter –global or kinetic ether.

Section *Physics of Motion* included in the book *Physics and Global Dynamics* studies the kinetic energy reticular mechanism causing motion of bodies with mass, both with super-symmetry and with the typical radial symmetry of gravity.

Of course, quantification of kinetic energy refers to the speed regarding natural reference system –**kinetic aether**.

We are not sure if the following example will be appropriate to the physical reality but, at least, we think it helps the brain to understand the proposed model intuitively. It is about an aforementioned example of the cotton, the thread, and the ball in the section about **Global Conservation Principle**.

*Global Mechanics* book gives a more realistic and abstract point of view.

- *Example of the thread and kinetic energy*

Imagine a vast volume full of cotton representing the **kinetic aether**.

If cotton was unbreakable and stretched from outside, the cotton filaments

were tense and in constant vibration due to the internal elasticity; then, if some filaments were turned and such torsion transmitted, then we will get electromagnetic energy.

When opposite turns met, threads will form little balls, which in our example would be the mass. These balls have the particularity of acting as slipknots.

Taking the initial mass at rest, the resultant force acting upon it from the interaction of the cotton filaments vibration with the ball is null.

## **Crash of planets** (Public domain image)





If in such situation a ball absorbs a little part of the thread due to a thread turn displacing towards it, the ball will increase its mass; moreover, the whole ball will deform by the absorbed turn. This mass increase would be kinetic energy and would affect the whole ball mass and its spatial configuration.

Now, due to ball new shape, the resultant force from the interaction of the cotton filaments with the ball will not be null and will cause the ball displacement as a slipknot. Physical speed will balance the different forces that the ball receives in any direction of Euclidean space, and will allow synchronization of both vibrations of the ball and the cotton filaments.

Another option is kinetic energy being a divine concept without a presence in our world or our dimensions. True existence of this kind of forces would come up against the very essence of absolute space concept and epistemological reasoning principles.

In the page *Mass and energy* from the book *Theory of the Relativity, Elements, and Criticism*, we have obtained theoretically, without any relativistic hypothesis, the mass concepts we consider relevant for *Global Physics*.

Reflected in the following equalities:

---

$$m_g = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

**global mass = mass at rest + kinetic mass**

**[2.a]  $m = m_0 / (1 - v^2/c^2)^{1/2}$**

---

Moreover, for lower speeds, following approximation is valid:

$$\text{[2.b] kinetic mass} \approx m_0 \frac{1}{2} \frac{v^2}{c^2}$$

The concept of global mass does not make any problem, as it is the total mass or sum of the mass at rest and the kinetic mass –mass provoking velocity or the mechanism of motion in the kinetic ether, and equivalent to the kinetic energy.

$$\text{[2.b.1] } E_c = \frac{1}{2} m_0 v^2$$

However, it is essential to distinguish between the total values of an equity and the physical realities within them, as they do not always correspond due to the limitations and inaccuracies of the physical model used. Any equality or equivalence is true, but they imply a form, point of view or perspective of seeing the reality and we all know that there are perspectives, which could be a little deceitful.

The mass appearing in the equation is the mass at rest, not the equivalent mass to the kinetic energy.

Although kinetic mass –equivalent to kinetic energy– integrates into the global mass, its quantification is very useful for purposes of the *Law of Global Gravity* and **Merlin effect**, as we have seen in the corresponding section.

Global Physics explains, in a different way, renowned **predictions** of Einstein's *General Relativity* –Paul Gerber in 1898 already had explained **Mercury's orbit**– by modifying Newton's *Universal Gravitation Law*. This modification gives rise to the *Law of Global Gravity* for elucidating the effect of a gravitational lens in **double-curvature of light** when passing near the stars, the anomalous **precession of the orbit of Mercury** and other planets, and the **gravitational redshift**.





### 3.b.2. Gravitational potential energy

*The gravitational potential energy of a mass  $m$  in a given point in space is the work done by the gravitational field to transfer mass  $m$  from such point to infinity.* According to this definition, potential energy is always negative, and its maximum is always zero. To be negative does not help much brain reasoning.

There must be reasons to resort to this kind of formalization of gravitational potential energy. We guess the maximum value, the minimum or something like that is unknown; in any case, we should accept that it should always be positive.

The different types of energy and their relationships give us keys about gravity nature.

Sections of Newton's *Law of Universal Gravitation* and *Global Law of Gravity* explained both components of the *atractis causa*.

If what one is searching for is a more conventional approach to potential energy definition, Wikipedia's page is always right.

When something is unknown for sure, temporary solutions are correct to move forward. The existence of negative energies, even being a convention, is an excellent example of what not to do, as it leads to a conflict with primary brain references when structuring new concepts.

Mechanical energy is the sum of kinetic energy and gravitational potential energy of bodies with mass in a gravity field.

Here lays a terminological problem since it is taught firstly that  $E_p = mgh$ , and later that  $E_p = -GMm/r$  which are nearly

equivalent expressions for the calculus of energy variations with height; however, the origin of energies alters and, therefore, concept alters and the hereinabove mentioned negative sign appears. We should point out that energy is a scalar magnitude.

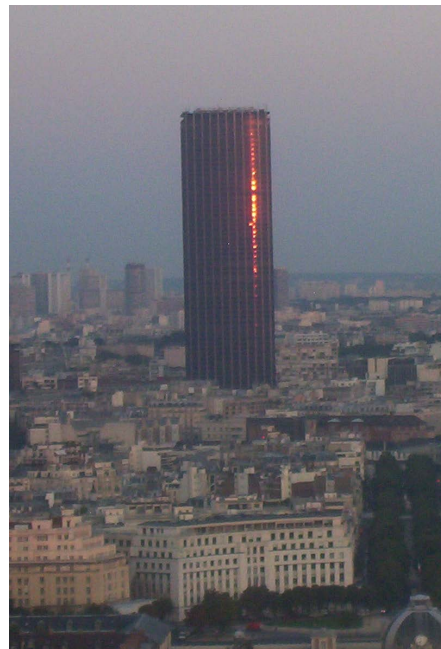
Thus, it is easy to come to understand the difficulty of comprehending any theory about gravity.

Regardless, with or without negative magnitudes, due to changes in properties of the bodies with variations in gravity field intensity and, in *Global Physics*, also with relative speed to the kinetic ether, gravitational energy is a complex manifestation of elastic energy.

As commented on the page about **mechanical energy**, this one continues to be a valid concept as the sum of kinetic energy and gravitational potential energy, but with the following observations:

- The mass increment due to speed, already pointed out by *General Relativity* and the corresponding increase in gravity force causes a bigger a more significant increase in kinetic energy than in Newton's *Classical Physics*.
- Increase in gravity force due to speed, independently of the increase mentioned in the previous point, explained by the second component of the attractis causa or **Merlin**

## Potential energy Montparnasse tower



**effect**, causes an additional increase in the kinetic energy and, therefore, in the gravitational potential energy.

*General Relativity* also carries out this adjustment; however, instead of modifying gravitational potential energy, it stretches and expands **space-time** for each particular mass.

The section about *movement with gravity* of the book *Physics and Global Dynamics* studies the reticular mechanism of kinetic energy causing motion on bodies with mass in the gravitational, kinetic or global aether, with the typical radial symmetry of gravitational potential energy.





### **3.b.3. Mechanical energy in Physics**

In *Modern Physics*, the definition of mechanical energy is the sum of kinetic and potential energies related to a specific mass in a gravitational field. In the absence of other forces, the mechanical energy of a body in orbit remains constant.

Mechanical energy is an abstract concept or a sum of energies of a mathematical nature that connects causes of inertial motion with motion due to the force of gravity.

The reason why mechanical energy is constant is conventional and derived from the Principle of Energy Conservation. In a closed system and with only two energy manifestations, the sum of both of them should be constant.

Newton's theory of gravitation explained planet orbits and outspread the principle of equality between inertial and gravitational mass. In both cases, the mass was a constant of proportionality between the applied force and the resulting acceleration of bodies. The acceleration of gravity follows the inverse-square law.

Einstein's *Theory of Relativity* keeps the principle of equality between inertial and gravitational mass but still, does not know what mass is beyond a constant of proportionality. Mass does not increase with relative speed thanks to the mathematical model used, but it is multiplied by  $\gamma$  –in fact as if it would increase–, and such increase makes necessary a higher force with higher speed to generate the same acceleration.

In Einstein's *General Relativity* mechanical energy is higher than in Newton's *Classical Physics* since the **kinetic energy** of a body in a vertical **free fall** will be higher because mass increases with

velocity.

However, according to observations, gravitational mass seems to have a different behavior from inertial mass. As an increase in mass with velocity does not alter the gravitational force by a unit of mass, Einstein's *General Relativity* needs to distort space to adjust orbits of the planets and their anomalous precession regarding Newton's *Law of Universal Gravitation*.

## **Mechanical energy**

Space Shuttle Discovery  
(Public domain image)



An additional problem generated by *General Relativity* is that, as space distortion follows the same law of the inverse-square whole gravity becomes a geometrical effect of the mathematical continuum and intuitive concepts of physical reality blur even more.

Since laws governing elasticity of the *global ether* are present in all type of physical relations –like the inverse-square law–, mathematical calculus of theoretical models on many occasions are useful with physical interpretations quite distant from reality. This topic even could seem so, so easy that is easy to get wrong.

For *Global Mechanics*, mass consists of loops of the filaments of gravitational, kinetic or global aether. Thus, the principle of equality between inertial and gravitational mass, besides being puzzling, it is not necessary anymore, because physical reality defines mass and not its behavior.

In *Global Physics*, the concept of kinetic energy is a property of mass associated with a tendency to keep its state of movement, which implies a higher mass **resonance** to conserve synchronization with the vibration of the global or kinetic ether.

Definition of **potential energy** is a property of the mass of being at a given point of the reticular structure of matter – global or gravitational ether– with radial symmetry.

The *Law of Global Gravity* provides a second modification or nuance to *Newton's Second Law, Law of Force* or *Fundamental Law of Dynamics*. If Einstein introduced an intrinsic variation of mass with velocity and the corresponding increase in gravitational attraction plus the **space-time** distortion, the *Law of Global Gravity* adds a variation in gravity force due to velocity, which is different from the correspondent mass increment, even though both variations are identical in quantitative terms.

In this case, an increase in gravitational acceleration, which would depend on kinetic energy –in particular, on the relationship between kinetic and global mass–, as observed in the *Law of Global Gravity*. This modification of Newton's *Law of Universal Gravitation* explains the anomalous precession of orbits of the planets without altering space and time.

$$\text{Global Gravity Law} \quad \mathbf{g}_g = \mathbf{G} \frac{\mathbf{M}[1 + \pi \mathbf{v}^2 / \mathbf{c}^2]}{\mathbf{r}^2}$$

As a result, a new increase in the force of gravity will generate higher acceleration, higher speed, and higher **kinetic energy**.

In other words, if kinetic energy is a component of gravitational acceleration, gravitational potential energy will change. That is, if gravitational force increases with motion, the sum of all forces along the trajectory of the **body's free fall**, which constitutes its gravitational **potential energy**, will also be higher.

In short, mechanical energy is higher in the *Law of Global Gravity* than in Einstein's *General Relativity*, which, in turn, is higher than in Newton's *Classical Physics*.

Nevertheless, it is required to make two conceptual clarifications regarding the previous paragraph.

- We cannot imagine how distortion of **space-time** affects **potential energy** in *General Relativity*.
- Mechanical energy in *Global Physics* depends on the scalar speed of the mass relative to kinetic ether and vector velocity relative to gravity field; accordingly, it is not constant.

The book *Physics and Global Dynamics* deals with both kinetic and gravitational potential energies from the viewpoint of the mechanisms of movement with the contribution of the *Law of Global Gravity*.

\* \* \*





## 4. ENERGY EXPERIMENTS

Besides the book *Global Physics Experiments* with mandatory experiments regarding the new theory, we include in this section the energy experiments directly connected to the *Law of Global Gravity*.

- Gigachron experiment
- Gravitational natural phenomena
  - Gravitational waves
  - Gravitational lens
  - Perihelion precession of Mercury's orbit
  - Gravitational redshift
  - Gravity Probe B

Of course, some are new experiments on energy, and others already known natural experiments or phenomena. However, we propose alternative interpretations to *General Relativity* or *Quantum Mechanics*, with interpretations made under a strict epistemological application of scientific method.

The few energy and gravity experiments –no thought experiments–, which confirm *General Relativity*, such as atomic clocks and the **Michelson-Morley experiment**, they also lead to consistent results under the new principles. Consequently, the only difference is the point of view, perspective, interpretation, measurement or philosophical methodology.

Nevertheless, just as in the case of non-relativistic explanations of *General Relativity's* **predictions**, due to their scientific relevance, the energy experiment Gigachron and some observations on **gravitational waves** are herein

presented.

In addition, we show the mathematical demonstration of how the *Laws of Global Gravity* perfectly explain natural phenomena of the light curve or gravitational lensing effect, and precession of Mercury's orbit.

There is also a non-relativistic explanation to the results of **Gravity Probe B** experiment, which includes a denial of the Lense-Thirring effect of frame dragging of mass by a rotational gravitational field, and an explanation of the real effect.

Besides, here we can find different mathematical formulas and equations, which make possible to calculate redshift without the relativistic perspective on Pound-Rebka experiment on light energy variation.

Finally, we also mention soundness of *Global Physics* with other natural phenomena in which gravitational processes intervene, such as Doppler effect on electromagnetic waves –light–, and cosmological redshift.



## 4.a) Gigachron experiment

In recent times, physicists have been looking for a unification of **fundamental forces**. Presumably, such unification will somehow entail the establishment of a new relation or connection between some elementary physical constants or physical equivalence relations between the units of involved magnitudes.

Perhaps, this gravitational energy experiment has something to do with the film *Raiders of the lost ark*, even though it sounds more like a super **space-time** synchronization of gravity; so big that we will return to god Chrono's absolute time, Euclid's close friend, the one of the Greek **space geometry**.

### REVELATION OF THE ENIGMA|

$$\begin{aligned} & \text{Speed of light}^2 \\ & * \text{ Planck constant} \\ & * \text{ Rydberg constant} \\ & / \text{ Gravitational constant} \\ & = \mathbf{g} \\ & = \mathbf{Earth\ gravity} \end{aligned}$$

The *Gravity Riddle* is an intriguing element of which the books on *Global Physics* base. It was not only already enunciated in the first book of *The Equation of Love* but also its embarrassing answer that multiplication of most known physical constants would be equal to a most known physical variable.

The formal approach represents a relation determining the force of gravity on the Earth's surface \*g\* from the following physical constants:

---

$$G * g = c^2 * h * R * n$$

- Being:

G = Universal Gravitational constant

g = Intensity of the gravitational field

c = Speed of light

h = Planck constant

R = from Rydberg constant formula

n = dimensional normalization constant of value one (=1)

---

The equation of Global Physics [ $g = E c / G$ ] deduces directly from the *Law of the Gravitational Equivalence* highlighted in Gigachron experiment.

Let us remind that gravity acceleration formula \*g\* is traditionally defined by:

$$g = G M / r^2 \text{ (m/s}^2\text{)}$$

Therefore, this variable depends on the particular radio, which is not even constant throughout the entire Earth's surface.

As can be seen, the equality of Gigachron experiment connects gravity, energy and mass constants, involving a unification of related forces, that is, the foundations of a theory of everything regarding elastic properties of the **global ether**.

In the mentioned book about physics and metaphysics, *The Equation of Love*, we comment some problems posed by several people. Even though these problems had a little logical

foundation, they are useful to show natural human reactions to a proposal for structural changes of established scientific theories.

That book concludes mentioning that validation of Gigachron experiment for such a particular case is not enough and that a generalization of experimental demonstration is necessary regarding the two following matters:

- To extend the same relation to the electromagnetic energy caused by other chemical elements.

This first point is not a problem, bearing in mind different energy levels of Bohr's atomic model, which remains valid regarding **Rydberg constant RH**.

**Balmer, Paschen, and Lyman** series adjust different energy levels of the electrons with Rydberg constant –in said numerical series wavelength appears, but we know that it corresponds to the frequency and, consequently, with energy.

- Different gravity conditions to those of Earth's surface.

This second generalization is more intricate because it seemed that the original idea was to verify the equality of Gigachron experiment on the Moon or the Space Station to change gravity conditions, as discussed in the page about the *Gravity Riddle* included in the book *The Equation of Love*.

Nevertheless, development of the book *Global Mechanics* lead us to a much closer solution. We are referring to gravity inside bodies or, instead, to gravity around the atomic nucleus. It may sound weird, but what changes is the gravitational constant G. Due to the complexity of this subject, which affects the unification of gravitational force

with the rest of **fundamental forces**, it is necessary to refer to mentioned book *Global Mechanics* and its section about *Gravity in the atomic distances*.

In any case, what we incorporate to the equality of this experiment is not a variation on gravitational constant  $G$ , but a new parameter, which should collect effects on variation in gravitational field intensity in the atomic spatial configuration. To do so, we use a variable of dimensional normalization  $*n.*$

It would not be surprising that this adjustment would need a series of numbers similar to Balmer, Paschen, and Lyman. Series which may gather effect on variation of the speed of light  $*c*$ , discussed in the page *Magnetic wave propagation and the variable speed of light* about the turning point of gravitational constant  $G$  and, in general terms, of spatial localization of atomic configuration.

From a practical point of view, let us remind that materials under microgravity conditions form with different properties.

The interrelation entailed by the *Gigachron experiment* brings consistency to the *Global Conservation Principle* on which *Global Physics* bases.





## 4.b) Gravitational phenomena

### 4.b.1. Characteristics of longitudinal and gravitational waves

The existence of *gravitational waves* \* –intuitively known by Newton, studied by Laplace and foreseen by Einstein’s *General Relativity*– is a fascinating subject, since they bring us closer to understanding gravity nature.

Within a non-academic point of view, regarding gravitational waves, we should bear in mind there are various meanings of the expression gravitational waves, and those detected by LIGO experiment are not the cause of gravity force. From another perspective, they are not produced by accelerating mass but by violent merging bodies. Finally, because of the *drag effect* they produce, they are most probably related to the so-called *expansion of the Universe* and dark energy.

One thing is the transmission of gravity itself, and another is the gravitational waves described by *General Relativity*; these two concepts are not the same in *Global Physics*.

Let us look at both concepts separately.

#### 1. Gravitational waves in General Relativity

These waves could refer to displacements of the reticular structure of matter –global, kinetic or gravitational ether–, which supports gravity, *kinetic energy* and mass. These displacements could themselves relate partly to *dark energy* and the expansion of the Universe as mentioned in the book *Global Astrophysics and Cosmology*.

However, due to nebulous concept of gravity in *General Relativity*, it calls gravitational waves both variations in gravitational field intensity, and **space-time** distortions. To avoid misunderstandings, gravity relativistic concept is space-time distortions, whatever effects it may produce.

The future LISA experiment –Laser Interferometer Space Antenna– will attempt to detect relativistic gravitational waves. It is an experiment similar to the one carried out by Michelson and Morley, but in outer space. Nevertheless, as we explain in the book *Global Physics Experiments*, we think it will show a different behavior of light than in the **Michelson-Morley experiment**. This would mean, more or less, the end of the *General Relativity*.

On the other hand, LIGO experiment –Laser Interferometer Gravitational-Wave Observatory– has finally detected gravitational waves. LIGO has the same objectives as LISA, but it is a ground experiment, carried out on Earth. As such, it does not contradict *General Relativity*.

The detection of relativistic gravitational waves from their effect on electromagnetic waves is curious because in *General Relativity* there is no ether unless one considers **space-time** itself to be an ether with mechanical properties.

Another exciting aspect of gravitational waves relates to the **origin of the universe**.

#### ■ **The Big Bang Theory and expansion of the universe**

Scientists have known the acceleration of the rate of expansion of the universe for some time; from calculations based on the luminosity of supernovae,



this value should be between 67 and 72 km/s per megaparsec.

The detection of the gravitational waves produced by the merger of two neutron stars –GW170817– has allowed scientists to fix at **70 km/s per megaparsec** \* the value of the increase in speed of the expansion of the universe in the 130 million light years that separate us from the origin of said merger. The article linked above implies accuracy would improve with more observations.

As these calculations approach the speed of light throughout the age of the universe, we can do the inverse calculation to determine the average increase in the velocity of expansion so that the observable universe is of the age stated by the **Big Bang Theory**.

The result is  $300.000 \text{ km/s} / (13.799/3,26) \text{ Mpc} = 70.8205371797101 \text{ km/s Mpc}$  and this calculation does not add any uncertainty besides the one obtained when determining the age of the universe.

In other words, it seems that what fixes the supposed age of the universe is its visibility, regardless of any initial explosion. Therefore, the Big Bang Theory could be incorrect or at least lose one of its main supports.

In any case, these considerations are very superficial because it would be quite complicated to draw the universe with just a few points without knowing, for instance, whether it is flat or spherical.

## 2. Gravity-generating waves

Concept of waves is broad and there are several classifications. Wikipedia's page about *physical waves* is quite

good and includes animated images.

Usually, when talking about gravitational waves as the origin of the **gravity force** –transmission of the tension in the longitudinal curvature of gravitational ether filaments in Global Physics– no one mentions which characteristics should have said waves, apart from transmitting or bearing the elastic **potential energy** of the virtual gravitational field.

The most intriguing aspect to us is the speed of gravitational waves. However, first let us see their characteristics about following criteria.

- *Waves requiring or not a medium*

According to *Global Physics*, every single wave needs a medium. Otherwise, they would be abstract or magical waves. Here we must quote Newton, as he disliked forces at distance.

Wikipedia differentiate between mechanical waves, such as sound waves, electromagnetic waves or those of transmission of so-called fields –assumed immaterial– and gravitational waves, which would represent the transmission of distortions in space itself.

It appears that *Modern Physics*, in addition to using phantom light waves, confuses changes in size and tension of the reticules of the gravitational ether with changes in space itself. It then uses time variations to fit with the model with observations of the physical reality, before turning, of course, to singularities and uncertainties as a last resort.

- *Periodic and non-periodic waves*

Gravitational waves should be periodic, since tension of gravitational ether is usually the same –unlike light

waves, which appear in a non-periodic way. The type of waves, which are non-periodic, is pulses.

The elastic energy of the gravitational or **global ether** needs a constant vibration due to concept of elasticity itself; a body at absolute rest could not have any internal energy.

- *Stationary and propagating waves*

Gravitational waves will be stationary waves, since force of gravity would exist in a static field of gravity.

The propagation of changes in tension of the longitudinal curvature should take place due to the vibration or **resonance** of stationary waves of gravitational ether.

- *Longitudinal and transverse waves*

Longitudinal tension of the reticular structure of matter should be kept with longitudinal spring-like waves or as two-dimensional waves; but not as torsion ones, such as the electromagnetic waves.

Nodes of longitudinal or two-dimensional waves could match the vertexes of the gravitational ether's grids.

Actually, the idea we want to illustrate is that both propagating waves of gravitational field intensity and electromagnetic waves propagate at the speed of the vibration or resonance of the gravitational ether's stationary longitudinal waves.

- *One-dimensional, two-dimensional and three-dimensional waves*

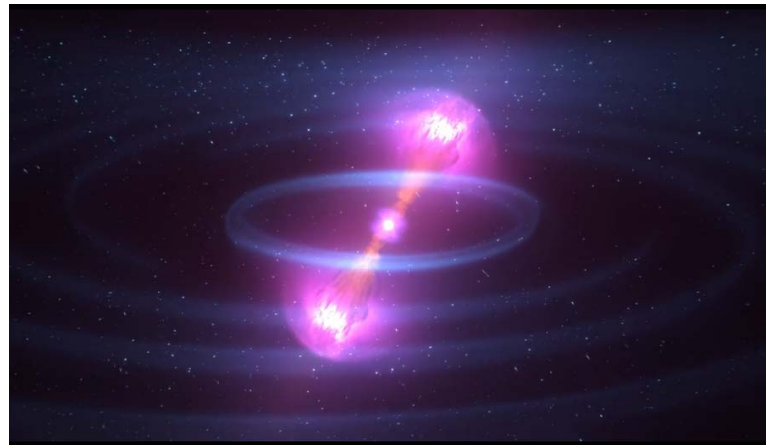
This concept on the dimensions of a wave is quite clear, however, we would say that a group of waves is often mistaken for a unique one because they coincide.

Let us look now at the speed of gravitational waves as transmission of tension of the longitudinal curvature due to changes in spatial location of mass that causes it.

This aspect about gravitational interaction was challenging; there was little and unclear information available. Just bear in mind that *Modern Physics* denies existence of

## **Neutron star merger GW170817**

NASA - (Public domain image)



the gravitational ether or any type of ether with mechanical properties. This last claim is nothing but a euphemism of Einstein's *Theory of Relativity*.

Vibration speed of the gravitational ether as longitudinal waves relates to point “*Magnetic wave propagation and constant speed of light*” included in section **Properties of light waves and photons** and electromagnetic interaction of the book *Global Mechanics*.

Resonance of mass is a different issue, since it increases with motion and with the gravitational ether's longitudinal tension, as discussed in section *Physics and movement in gravity* of the book *Physics and Global Dynamics*, it can vary from  $*c*$  so as to almost  $c^2$

Before, there were two possibilities regarding the speed of gravitational waves as transmission of the tension of the

longitudinal curvature responsible for the force of gravity. However, nowadays it seems clear that both gravitational waves and electromagnetic energy have the same speed.

The fact that the velocity of gravitational waves and light is the same should be a consequence of some physical characteristic of the medium through which both travel. Otherwise, this would be a tremendous virtual coincidence.

Arguments would be:

- **Speed  $c^2$  or a figure of a similar order**

Laplace stated in 1825 that gravitational waves propagation speed should be at least  $10^8 c$  due to difference between direction of the Earth's centripetal acceleration towards the Sun and direction of the light coming from the Sun to the Earth.

Now, let see where the Earth's centripetal acceleration points at due to the effect of the Sun's gravitational force. As we already know that it takes 8.3 minutes for the light to reach the Earth from the Sun. The direction of light points at the sun's location 8.3 minutes before, there should be an adjustment because of light dragging, which, however, will be a small one since mentioned drag decreases rapidly with distance.

Thanks to the astronomical observations made, it is known that the Earth's centripetal acceleration vector points 20 arc seconds at the direction of motion of the Sun regarding the one of Light; in other words, it points at the correct spatial location of the Sun in that precise moment.

Other studies with solar eclipse due to the Moon and

with binary pulsars provide similar minimum quantities.

- **The speed of gravity longitudinal waves is equal to the speed of light**

One might think that the centripetal force over the Earth points faithfully to the Sun is not because of gravitational waves speed, but because gravitational forces are additive. In the context in which the Sun has a galactic translational movement, the Earth's motion is due both to the Sun's gravitational force and to the force of gravity responsible for said Sun's motion, which will affect the Earth in exactly the same way.

In their words, if we take out the gravitational force on both the Sun and the Earth, the result will be a static Sun. Therefore, there would be no need to imagine the speed of any gravitational wave, since gravity force will not vary because we are only considering the variation in the Sun's gravitational force, which is null.

*Global Law of Gravity's* argumentation about the **attractis causa**, regarding that gravitational force affects light twice than mass according Newton's gravity, is consistent with the similar transmission speed of gravity and light.

Scientists from the Missouri-Columbia University have claimed, in 2003, that they have measured the speed of gravity within a margin of error of 20% and they maintain it is equal to electromagnetic waves speed.

Finally, gravitational waves detected by LIGO experiment have the same speed as light.







#### 4.b.2. Light curve and gravitational lensing effect

Prediction about the behavior of stars as a gravitational lens in the light curve was the first of the three main **predictions of General Relativity**. Besides, it was very famous because of delay in its experimental confirmation, which did not take place until the 1919 solar eclipse.

Undoubtedly, the fame of this prediction is also due to the natural understanding of a magnifying glass effect, and that the light curve predicted and confirmed by gravitational lensing effect was exactly twice the value applying Newton's **Law of Universal Gravitation**.

It is bizarre that **space-time** continuum is stretched-prolonged in the light curve because of gravitational lensing effect in factor **\*2\*** regarding what was foreseen by Newton's *Gravitational Law* and no one seems to know its physical reason, especially when the number is quite round and straightforward. Of course, there are systematic references to Einstein's field tensor equations, gravity being a geometric effect of space-time and energy involvement.

Searching the Web –see article **bending Light en mathpages.com** \*– or asking any friend who knows something about mathematics and elliptic geometry, we will say that any particle which passes near the Sun describes a hyperbole. Because the Sun acts as a gravitational lens and that, depending on its eccentricity, for small values of **m** regarding **r<sub>0</sub>** and according to Newton's Gravitational Law, the angle or total light curve should be equal to:

$$\alpha = 2 m / r_0 = 0,875'' \text{ arc seconds}$$

Where  $m$  is the mass of the Sun in geometric units –mass multiplied by  $G$  or Gravitational Constant and divided by the speed of light squared– and  $r_0$  is the closer distance of ray of light to the Sun.

To remind geometry of a circle, we will just say that there are 360 degrees in a full turn, 60' minutes in each grade and 60" arc seconds in each minute.

Therefore, angle or light curve provoked by gravitational lensing in Newton's *Law of Universal Gravitation* is directly proportional to the mass generated by the field of gravity, since centripetal force is directly proportional to the mass.

Even though a planet has mass, in *Classical Mechanics* its mass does not affect, since gravitational force on the planet is proportional to its gravitational mass. Therefore, force by a gravitational unit of mass will remain constant even if we take into account the kinetic mass –mass equivalent to kinetic energy.

Nevertheless, with the *Law of Global Gravity*, there is an additional force, the second component of the attractis causa or **Merlin effect** is due to velocity and operates on kinetic mass. Global mass is the mass at rest plus the mass equivalent to **kinetic energy**. In case of light, the mass at rest does not exist.

In section *Law of Global Gravity*, we mentioned we should express said the law in energy terms rather than in mass terms since gravitational interaction means an energy transfer between gravity field and the elastic energy in the form of mass, kinetic mass or electromagnetic energy.

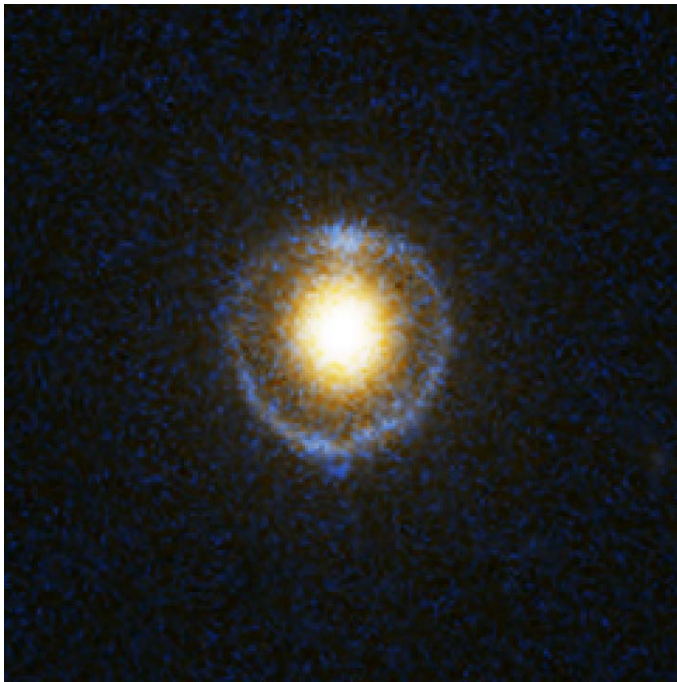
In order to calculate light curve in gravitational lensing effect, we only have to verify that second component or additional force of gravity derived from speed is quantitatively equal to

the first component.

Intuitively, it is simple, because light **kinetic energy** value will be equal to the supposed equivalent kinetic mass.

## **Gravitational lensing Einstein Ring - NASA**

(Public domain image)



From another point of view, the first component of the *attractis causa* is due to the propagation speed of the **global ether's** longitudinal tension, and it is equal to the speed of light. Since second component – **Merlin effect**– is due to the speed of light for the case of electromagnetic energy, both components of the *attractis causa* will have the same value and light curve due to

gravitational lenses will be twice the value we would obtain with Newton's *Gravitational Law*.

Previous explanation of the physical cause of gravitational lensing effect is a summary of what we discussed in both the chapter of this book and sections on motion **with super symmetry** and **gravity radial symmetry** of the book *Physics and Global Dynamics*.

Nevertheless, for mathematics lovers we have included the following quantitative analysis, which has some educational value and, to some extent, it is common to *Global Physics* and *General Relativity*.

## QUANTITATIVE ANALYSIS

We have previously mentioned **relativistic mass** or increase in mass due to velocity is a partially correct aspect of the *Theory of Relativity* –when it uses natural reference system– and, consequently, this concept remains in *Global Physics*. This new theory seats on pure experimental observation and theoretical energetic transfer mechanisms of gravitational interaction, in comparison with the imposition of mathematical axioms in *Modern Physics*.

In other words, there is no need for the *Theory of Relativity* to accept said the increase in **physical mass**.

The famous global mass formula used for inferring the kinetic energy in relativistic terms is the following one:

---

$$m_g = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

**global mass = mass at rest + kinetic mass**

$$[2.a] \quad m = m_0 / (1 - v^2/c^2)^{1/2}$$

---

Alternatively, for short,

$$m_g = \gamma m_0$$

Where **m** is the mass or relativistic mass of the body, **m<sub>0</sub>** is mass at rest and **v** the velocity.

As pointed out by the *Theory of Relativity* of Einstein, **kinetic energy** is equivalent to increase of the mass at rest **m<sub>0</sub>**

The result of the series expansion of Taylor's theorem of constant  $\gamma$  is:

$$\gamma = 1 + \frac{1}{2} \frac{v^2}{c^2} + \frac{3}{8} \frac{v^4}{c^4} + \frac{5}{16} \frac{v^6}{c^6} + \dots$$

$$\text{Kinetic energy} = m_0 \left[ \frac{1}{2} \frac{v^2}{c^2} + \frac{3}{8} \frac{v^4}{c^4} + \frac{5}{16} \frac{v^6}{c^6} + \dots \right]$$

To these effects, the relevant equation of global mass should not include the simplification made for classical kinetic energy in the series development of Taylor's theorem, since the second term in the parenthesis becomes significant for speeds similar to the speed of light.

As a good Einstein, at this point I asked a Mensa friend who was studying Exact Sciences at university. He answered that he did not feel like calculating third derivatives. I can understand him, of course, and even though he is still my friend.

Apart from amusing anecdotes, only the terms corresponding to function derivatives in the expansion of Taylor's series are valid as long as said derivatives exist; in other words, as long as they are different from zero. In general, mathematically in the preceding equality, the last valid term calculus collects the eliminated terms.

In this case, if we accumulate  $( \frac{1}{8} \frac{v^4}{c^4} )$  to the second term we will obtain the residual effect of the rest of eliminated terms, and the result will be:

$$\text{Kinetic energy} = m_0 \left[ \frac{1}{2} \frac{v^2}{c^2} + \frac{1}{2} \frac{v^4}{c^4} \right]$$

Obviously, the first term of the parenthesis can vanish with low or non-planetary speeds, while the second one will disappear with planetary velocities but not

with speeds close to speed of light and, in no way, with similar velocities to light as in case of gravitational lensing effect. Consequently, within a general analysis, we should consider all possibilities the physical mass velocity to resolve total gravity force.

Furthermore, in equation (2) of webpage [Mathpages.com](http://Mathpages.com) \* about the inertia of energy we can find the use of this series development of Taylor's theorem.

**Law of Global Gravity**

(Speeds similar to the speed of light)

$$g_g = G \frac{M [1 + \frac{1}{2} v^2/c^2 + \frac{1}{2} v^4/c^4]}{r^2}$$

*General Relativity* proving gravitational lensing effect is twice than in Newton's *Gravitational Law* is quite intricate. However, it inevitably uses same series development of Taylor's theorem, as one may see on the Web page about the light curve of [Mathpages.com](http://Mathpages.com).

On the other hand, without taking into account Taylor's series development, the calculus cannot be accessible in *Global Physics*.

Therefore, angle due to gravitational lensing effect will be twice the one predicted by the *Law of Universal Gravitation* of Newton, as we already knew by famous observations of the 1919 solar eclipse and subsequent ones, being 1,75"arc seconds.







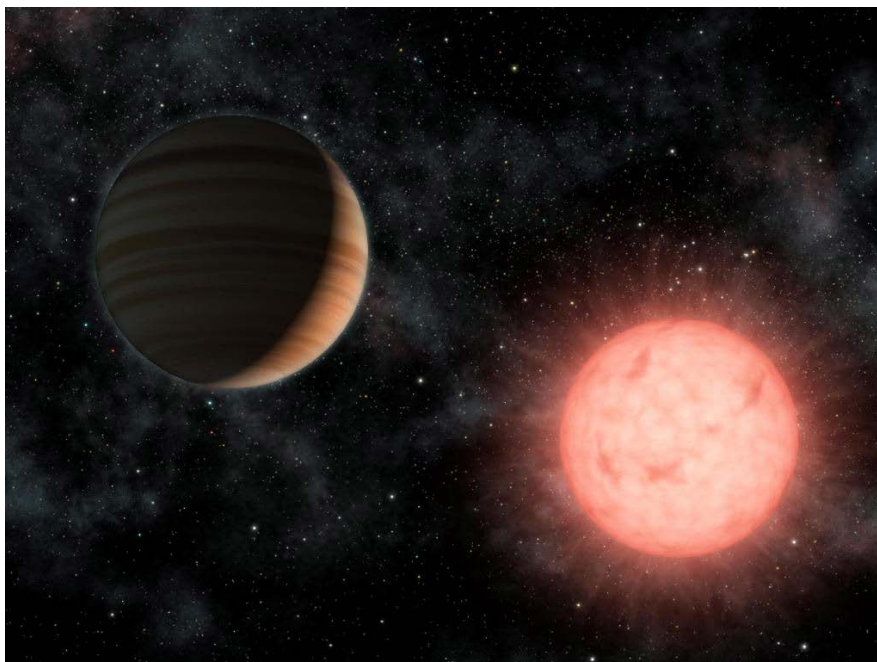
### **IV.b.3. Celestial Mechanics and Planet Mercury's orbit**

If the prediction of Einstein's *General Relativity* about the **curvature of light** is the most striking and spectacular one, due to its verification with the eclipse of 1919, explanation of precession of the perihelion of Mercury's orbit –deviation from Newton's *Celestial Mechanics*– is the most effective one thanks to its quantitative nature.

However, let us remark that in 1898 Paul Gerber explained this precession before relativistic physics with the same exact formula.

### **Exoplanet**

(Public domain image)



Astronomers had observed a deviation –unexplained by any known factor– of 43.1'' of arc (43 arc seconds) in 100 years in the axis of the planet Mercury's orbit. This deviation is to

what refers precession of the perihelion of Mercury's orbit, although in a strict sense, total precession –sum of explained and not-explained precessions– is quite a lot bigger. Non-explained precession of Mercury's orbit is about one ten-thousandth of a degree per year.

Using sophisticated field equations of relativistic mechanics, Einstein arrived at a figure very close to 43'' arc seconds of the precession of *Mercury's orbit*, not explained by *Celestial Mechanics*. See the webpage of [Mathpages](#) \* regarding the anomalous precession of Mercury's orbit as explained by *General Relativity*.

It is not surprising that, given adjustment to orbits of the planets obtained by *General Relativity*, relativity as a whole would end up accepted, in detriment of other less adventurous alternatives. It is unquestionable that field equations of Einstein's *General Relativity* contain some valid behavioral rules of nature, though they may hide in their mechanisms of conduct and calculus. Of course, we could say the same about Paul Gerber original ideas.

Let us now look to see if the *Laws of Global Gravity* also explain the precession of the perihelion of Mercury's orbit.

$$\text{Global Gravity Law} \quad \mathbf{g}_g = \mathbf{G} \frac{\mathbf{M}[1 + \pi \mathbf{v}^2 / \mathbf{c}^2]}{\mathbf{r}^2}$$

The expression for gravity acceleration –taken from the formula of the *Global Law of Gravity*– provides us with desired results on the angular deviation and the normal component of acceleration or centripetal acceleration.

To know total angular deviation in one revolution or the orbit of Mercury, we only have to substitute variables for their values. Acceleration  $*g_g*$  should represent both the gravity force due to centripetal acceleration corresponding to Newton's law and **Merlin effect** –second component of the attractis cause in *Global Gravity Law*.

That is,  $*g_g*$  will be the normal component of the acceleration or centripetal acceleration, which will cause a complete revolution of the planet in its orbit and observed precession for the period  $*T*$ .

This period  $*T*$ , by its definition in trigonometry, would cause precisely one complete revolution according to Newton's *Law of Universal Gravitation*. As Kepler's laws showed from orbits of the planets of *Celestial Mechanics*, we know that a perfectly elliptical orbit would result from the inverse-square law –of the radius.

Don Magufo revealed a fast way to estimate centripetal acceleration or normal component of the acceleration with intuitive mathematics. But before continuing, we would like to review the necessary data to carry out calculus, plus the unnecessary  $*v*$ , which are:

---

$$\mathbf{G} = \text{Universal gravitational constant} = 6,67266 * 10^{-11} \text{ (m}^2 \text{ N / kg}^2\text{)}$$

$$\mathbf{c} = \text{Speed of light} = 2,99792458 * 10^8 \text{ (m/s)}$$

$$\mathbf{M} = \text{Mass of the the Sun} = 1,98892 * 10^{30} \text{ (Kg.)}$$

$$\mathbf{r} = \text{Average radius of Mercury's orbit} = 57,9 * 10^6 \text{ (m)}$$

$$\mathbf{T} = \text{Mercury's orbit period} = 7,60018 * 10^6 \text{ seconds} = 414,9378 \text{ orbits in 100 years}$$

$$\mathbf{v} = \text{Average speed of Mercury} = 47948,31 \text{ (m/s)}$$

---

For empirical verification of planet Mercury's dynamics we

have the following steps:

a. **Circular planetary orbit**

We have chosen a circular orbit case to simplify calculus because the play of gravity forces would continue to exist and eccentricity of planet Mercury's orbit is quite low. It is enough for our purpose here.

b. **Calculus of revolutions per period with Newton's Law of Gravity**

The formula for the *Global Gravity Law* equals the sum of two components:

$$\mathbf{g}_g = \mathbf{G} \frac{\mathbf{M}}{\mathbf{r}^2} + \mathbf{G} \frac{\mathbf{M} \pi \mathbf{v}^2}{\mathbf{r} \mathbf{c}^2 \mathbf{r}}$$

The first term on the right-hand side of the equation is the gravity of Newton's law or centripetal acceleration. In one period, it produces an angular variation of one revolution – or  $2\pi$  radians.

So then, if we multiply and divide it by  $v^2$ , and substitute  $v^2/r$  for the normal component of acceleration or centripetal acceleration  $a_n$ , we will be left with:

$$\mathbf{G} \frac{\mathbf{M}}{\mathbf{r}^2} = \frac{\mathbf{GM}}{\mathbf{r}} * \frac{\mathbf{v}^2}{\mathbf{r}} * \frac{1}{\mathbf{v}^2}$$

Recalling that orbital speed is the square root of  $\mathbf{GM}/\mathbf{r}$ , we have:

$$\mathbf{G} \frac{\mathbf{M}}{\mathbf{r}^2} = \frac{\mathbf{v}^2}{\mathbf{r}} = \mathbf{a}_n$$

The normal component of acceleration  $a_n$  is related to change in the direction of velocity with time. If we evaluate

this change for each  $m/s$  –dividing it by  $v$ – and we multiply it by period  $T$  –number of total seconds in one revolution–, it will give us through trigonometry  $2\pi$  radians –one entire revolution of planet’s orbit.

Analytically, above reasoning would be:

We could verify it by carrying out calculus using the value of the average speed of the planet Mercury. One entire revolution has  $2\pi$  radians or 360 degrees, each degree has 60’ minutes and each minute has 60’’ arc seconds.

---


$$v T = 2\pi r$$

$$w T = 2\pi$$

$$v / r = w$$

$$a_n / v = w$$

$$a_n T / v = T (v^2/r) (1/v)$$

$$= T v / r = w T =$$

$$= 2\pi \text{ Radians Q.E.D.}$$


---

### Centripetal acceleration and linear speed of planet Mercury

G			6,67266E-11
Mass of the Sun	1,98892E+30	GM	1,32714E+20
Average radius	5,79000E+10	$a_n = GM/r^2$	3,95876E-02
Average v	4,794831E+04	$a_n / v = w$	8,25631E-07
Revol. 100 years	4,149378E+02		
Period T	7,60018E+06	$w * T = 2\pi$	6,27494E+00

#### c. Calculus of revolutions per period due to the Merlin effect

We are looking for the second term on the right-hand side of the equation for the *Global Gravity Law*, given that it is

the centripetal acceleration caused by **Merlin effect** – double attraction provoked by **kinetic energy**. This centripetal acceleration will cause the precession of the perihelion of Mercury (ppm) –or of any planet’s orbit in *Celestial Mechanics*– if we estimate it for the entire period, considering how we did it previously with  $*a(n)*$  to calculate the  $*2\pi*$  radians.


According to Don Magufo, the intuitive integral of the differential equation not set out can be directly resolved if, once  $*v^2/r*$  is substituted by  $*a(n)*$ , we use its value for a whole period, which, as we have just discussed above, in terms of trigonometry will be  $*2\pi*$ .

In strict terms, it is enough to mention that formal integral, regarding the period, of centripetal acceleration, resolves without any problem; since speed, centripetal acceleration and rest of variables are all either constant or independent of time, due to simplification to a circular orbit of the planet Mercury. For this reason, it coincides with the simple calculations of trigonometry, as integral to  $*dt*$  is 1.

So it remains that:

$$g_g T / v = 2 \pi + \frac{2 \pi^2 GM}{rc^2} \text{ radians}$$

Therefore, the precession of the perihelion of Mercury in radians will be:



$$ppm = 2 \pi^2 \frac{GM}{rc^2} \text{ radians}$$

Value of ppm obtained using above equality, derived from *Global Physics*, is 43.08” arc seconds every 100 years, as following table shows:

## Perihelion of planet Mercury

### Precession calculus

G			6,67266E-11
Mass of the Sun	1,98892E+30	GM	1,32714E+20
Average radius	5,79000E+10	$a_n = GM/r$	2,29212E+09
$c^2$	8,98755E+16	$GM / r c^2$	2,55033E-08
$\pi$	3,141592654	$\pi GM / r c^2$	8,01210E-08
2 $\pi$ Radians/revol.	6,283185307	ppm = $2\pi^2 GM / r c^2$	5,03415E-07
Revol./100 years	4,14938E+02	radians/100 years	2,08886E-04
Arc sec/radian	2,06265E+05	Arc sec/100 years	4,30858E+01

\* \* \*

Let us recall that, if in this formula we replaced  $2\pi$  by  $6$ , it would give us the formula obtained by Paul Gerber in 1898 and Einstein in *General Relativity*, regardless of the eccentricity, as mentioned in the book *Theory of Relativity, Elements, and Criticism*.

For Earth, Einstein's *General Relativity* gives a value of 3.8 arc seconds; *Global Physics* gives 4.02, and the observed value is 5 arcs econds according to *Mathpages* mentioned website.

**Anomalous precession of Solar System planets**

General Relativity and Global Physics

Average radius 10 <sup>6</sup> km	Planets	Radians	Revolutions 100 years	Total radians	Precession arc second		
					Observed	RG	GF
57,90	Mercury	5,03415E-07	414,93780	2,08886E-04	43.10	42,9195	43,08581
108,20	Venus	2,69387E-07	162,60160	4,38028E-05	8.65	8,6186	9,03498
149,60	Earth	1,94838E-07	100,00000	1,94838E-05	3,85	3,8345	4,01882
227,90	Mars	1,27897E-07	53,19150	6,80303E-06	1,36	1,3502	1,40323
778,30	Jupiter	3,74505E-08	8,43170	3,15771E-07		0,0623	0,06513
1427,00	Saturn	2,04259E-08	3,39440	6,93336E-08		0,0137	0,01430
2869,60	Uranus	1,01574E-08	1,19030	1,20904E-08		0,0024	0,00249
4496,60	Neptune	6,48217E-09	0,60680	3,93338E-09		0,0008	0,00081
5900,00	Pluto	4,94029E-09	0,40320	1,99193E-09		0,0004	0,00041

Although there is no doubt both theories are good approximations –three if we include Paul Gerber–, or forms of looking at the same problem about the orbit of the planet Mercury, we must say they are mutually incompatible since same angular deviation would be doubly explained.

Moreover, they have different and contradictory principles, which will make unnecessary to resort to Occam razor. Also, other natural phenomena and physics experiments will help to tip the balance definitively.

With the *Laws of Global Gravity*, we have accurately explained the precession of the perihelion of Mercury's orbit, because of the Merlin effect in the interaction of global or kinetic aether with bodies with mass.

In other words, the **principle of equality between gravitational and inertial mass** established by Newton and upheld by Einstein is vague and unnecessary, given that behavior of **physical mass** in its interaction with **kinetic aether** is the same with or without a gravitational field, although there could appear different forces. However, in *Global Physics*, there is no need to stretch time and space to explain elliptical orbits of



the planets.

Section *Second Law of Newton* of the book *Physics and Global Dynamics* studies in more depth differences between Newton, Einstein and *Global Physics*, which are due to fundamental changes in mass and acting forces.

Another experiment regarding planetary orbits is in the page *Paradox of the last relativistic dolphin* of the *Global Astrophysics and Cosmology* book.

To conclude, we would like to point out that not once has been abandoned the non-curved *geometry of Euclidean space*, despite planet Mercury's orbit, and that *Global Physics* is consistent with absolute time.





When **Einsother** finished the Web page,  
he happily went to tell it to **Prinspick**, who said:

–Very good. And what did you do after that? –

**Einsother**, hesitating a pit, dit:

– I started to play with marbles  
thinking about number  $\pi$ .

Then, a pish girl appeared,  
she threw herself at my pheet,  
and opened her pleegs  
staring at my piballs. –

And **Prinspick** exclaimed:

*–That's picorny! –*

---



#### **4.b.4. Gravitational redshift**

Gravitational redshift, Doppler effect of light and cosmological redshift due to the **expansion of the universe** make up a group of three different redshifts, which are often confused because they cause similar changes in the frequency of electromagnetic waves.

As we have seen before, the *Law of Global Gravity* incorporates in a mathematical formula the **Merlin effect**, or second component of *attractis causa*, on both mass motion and electromagnetic energy propagation; explaining, respectively, the anomalous precession of planet orbits and light curve due to gravitational lenses.

We also know that the *Law of Global Gravity* applies not only to planet orbits but also to movement of bodies with mass in vertical **free fall** towards the gravitational attraction center. Likewise, it will apply to light when it goes directly towards a planet or star. Nevertheless, there is a problem, speed of light depends on its peculiar characteristics –as mentioned in the book *Global Mechanics*–, and gravitational energy transfer will imply an increase in electromagnetic energy frequency instead of a rise in its speed.

We must take into account that the *Law of Global Gravity* reflects a particular approach to the fundamental law of *Global Physics* or ***Gravitational Law of Equivalence***. In gravitational lensing effect, the *Law of Global Gravity* resolves the light curvature; although it does not mean that a little increase in electromagnetic energy cannot take place.

Einstein propounded this natural phenomenon within his *Theory of General Relativity*. The physical experiment proving

gravitational redshift is Pound, and Rebka was in 1960. They measured the red and blue shift in a proportion  $2.46 * 10^{-15}$  of a gamma radiation emitted from the ground or the tower top ( $h = \text{height} = 22.6 \text{ meters}$ ) and observed from the top of the ground, respectively.

Let see now an accessible explanation of gravitational red or blue shift without expanding time or bending space, and not only with an alternative theory of Einstein's relativity but with even more options.

Let us remind *Global Physics* accepts as correct mass increase due to velocity respect its natural reference system, which is **global ether** or material support for gravity field, **kinetic energy**, and the mass. Also, gravity field is supporting medium for electromagnetic energy or **luminiferous ether**.

Even though variations in the intensity of gravity field affect the speed of light, it will have minimal effect on it. Calculus of gravitational redshift does not take into consideration several secondary quantitative effects to explain Pound, and Rebka's physical experiment.

The principle of Energy Conservation states that energy difference will compensate. Accordingly, **Principle of Global Conservation** just explicitly extends the idea to gravity when proposing the mass-energy-gravity equivalence. Therefore, energy gained by a photon when it moves from the tower top to the ground must be equal to energy provided by a gravitational field.

GRAVITATIONAL RED SHIFT - P & R		
Pound-Rebka Experiment	Tower base	Tower height 22,60
c	2,99792E+08	
G	6,67266E-11	
Planck constant	6,62608E-34	
Earth mass	5,97370E+24	
r	6,37534E+06	6,37536E+06
g	9,80700E+00	9,80693E+00
E radiacion iron57	2,30688E-15	2,3068800E-15
equivalent mass	2,5667502E-32	
$\nu$ frequency	3,4815178E+18	
$\lambda$ wavelength	8,6109701E-11	

We can evaluate the proportional change in energy of electromagnetic waves in several ways. Besides, as we know that energy of electromagnetic waves is equal to Plank constant multiplied by its frequency ( $E = h \nu$ ), it will give us necessary percentage change in frequency to absorb energy gained in the **free fall**.

However, by taking into consideration that speed of light – electromagnetic energy– is equal to its frequency multiplied by wavelength ( $c = \lambda \nu$ ), we will obtain the wavelength and verify if it coincides with the obtained records.

In the table appear known and any other necessary data – equivalent mass– to make pertinent calculus.

As we will see below, we can explain gravitational redshift in several ways. However, that does not mean all of them are correct.

1 Increase of light speed while passing through the tower		
t pasar la luz = h/c	7,5385486E-08	
$\Delta v = gt$	7,3930021E-07	-7,3930546E-07
$\Delta \lambda / \lambda = \Delta v / c$	2.4660401E-15	-2.4660576E-15

For example, the way by which **c** is increased to evaluate total

wavelength rise and, with its proportional increase, achieve the correct result does not prove that a speed higher than  $c$  exists.

2 Proportional assignment to the increase of speed	
$\Delta E = E \Delta v / c$	5,6888585E-30
$\Delta E / E$	2,4660401E-15

Likewise, the fact that proportional velocity increment can mathematically explain same energy increase relation does not guarantee that increase above in speed of light is possible.

The three explanations revealing the process-taking place are those expressing the energy transfer produced. They mean an increase in light frequency due to its nature, with its corresponding gravitational blue shift when it moves towards the center of the gravitational field, and a decrease in its frequency with a gravitational redshift of the wavelength when it moves away from it.

This physical effect is the same as a light curve or gravitational lensing effect of the stars. The only difference between them is the spatial orientation of movement of light. If it goes towards the star or planet, would be blue shift or redshift when it moves away. If it is tangential, it would be a light curve.

The fact that temporal expansions and space curvatures can explain natural phenomena of **precession of Mercury's orbit**, light curve, and red and blue shifts do not imply they necessarily occur. Mainly, because, it seems a little arbitrary that a temporal expansion, in one case, and a space curvature, in the other, may occur in Einstein's Relativistic Mechanics.



3 Kinetic energy fall from h = 22,6 m			
t drop = root(2h/g)	2,14685E+00		
v soil = g t	2,10541E+01		
$\Delta E = \frac{1}{2} m v_{\text{soil}}^2$	5,6888585E-30		
$\Delta E / E$	2,4660401E-15		
4 Gravitational potential energy			
$\Delta E_{\text{pg}} = -GMm/r$	5,6888787E-30	-5,6888787E-30	
$\Delta E_{\text{pg}} = mgr_1 - mgr_2$	5,6888787E-30	-5,6888787E-30	
5 Kinetic energy Vescape			
Vescape = raíz(2gr)	1,1182390E+04	1,1182370E+04	
$\Delta E_{c_e} = \frac{1}{2} m v_e^2$	5,6888787E-30	-5,6888787E-30	

Energy will be variable or relative if we accept speed of light remains constant in its natural reference system, and we change time definition, to make it independent of the cesium atom energy. Nevertheless, there will also be a change in speed of light due to changes in conditions of its medium support.

Overall, gravitational redshift is due to a gravitational process of energy transmission; in other words, there is no need to stretch or expand time and space.

## Other similar processes of light

### ■ Doppler effect in light

Doppler effect of light or relativistic Doppler effect differs from Doppler effect of mechanical waves, such as sound waves.

With *Global Physics* it should change its name to Global Doppler effect because it will have a mechanical nature again without relativity of time and space.

Due to the current relativistic paradigm, Doppler effect of

light calculus needs to make time relative time or representing the absorption of a photon against a body with relative movement with a higher speed than  $*c*$  or, otherwise, lower.

Doppler effect of light, as all gravitational processes, should maintain energy equivalence of electromagnetic waves when they begin, during their motion –at a constant speed in certain conditions– and at their final reception.

Likewise, argumentation is similar to gravitational redshift, although specific details are different and, maybe, more complex because in relativistic Doppler effect intervene more energy effects. Not only there may be changes in velocity but also in its supporting medium or **luminiferous ether** and its relation with global aether.

There is an essential difference between relativistic Doppler effect and same effect in *Global Physics*. For the second one, an energy effect will occur on the moving body regarding its natural reference system.

If the emitting body is in motion, its velocity implies a frequency of the corresponding atomic orbital of a higher emission that if it is at rest. Therefore, the wave will have a higher frequency due to this energy effect, independently of the sending direction, which will have its own effect.

Regarding real velocity of emission and similar impact to Doppler effect of sound –that is why it adopts its name– the *Theory of Relativity* cannot accept speeds of light different from  $*c*$ , even for this obvious cases.

Doppler effect of light, when the object in motion is the receiver, does not imply the wave had a higher frequency; the wave had its frequency independently from the receiver. The possible effect would be energy impact is

higher if Galilean relative velocity is bigger than  $*c*$  and lower otherwise. We would say a similar effect happens in a typical impact when someone is running down the street.

As previously seen in the section about gravitational redshift, we can quantify these processes in many ways, some are more real and others more imaginary and artificial.

### ■ **Cosmological redshift**

The three gravitational processes regarding the redshift usually take place in the propagation of electromagnetic waves. Firstly, relativistic Doppler effect of light, because the emitting star is usually in motion; secondly, gravitational redshift when it moves away from the gravitational field of the said star. On the other hand, when receiving the wave, opposite effects will take place, blue shift as it approaches the Earth, and red or blue shift according to Earth's movement.

The third gravitational process, which is not yet fully explained, is a different redshift as it is independent of two previous ones, it is the cosmological shift.

We do not know its causes. Maybe it has something to do with longitudinal tension of **global ether** –reticular structure of matter and its **expansion or expansion of the universe**–, or the tension of longitudinal curvature that causes the force of gravity, or with both.

The cosmological shift could relate to **dark energy** or **dark matter**. Book *Global Astrophysics and Cosmology* study these dark subjects.

\* \* \*

#### **4.b.5. Gravity Probe-B experiment**

The **Gravity Probe B** \* mission proved to be, in part, success with its gyroscopes. It confirmed the **de Sitter effect** \* or geodetic precession and the **Lense-Thirring effect** \* or drag effect on mass but did not manage to reduce measurement error from previous experiments.

Regardless, the Gravity Probe B satellite provided additional confirmation of both effects. Furthermore, improvements on several technological limitations and our understanding of small effects from classical physics will be significant when it comes to future missions.

Geodetic precession –or geodesic– of gyroscopes in the plane of their orbit corresponds to similar effect producing the anomalous precession of Mercury.

According to Wikipedia, the main difference between geodetic precession or *de Sitter effect* and *Lense-Thirring precession* –frame dragging– is that de Sitter effect is due to the presence of a central mass, while Lense-Thirring precession comes from a rotation of said central mass.

*General Relativity* predicts Lense-Thirring effect. According to Einstein, it relates to Mach's principle and implies a dragging of mass and electromagnetic energy by the gravitational field. Einstein added that, due to its small quantitative impact, it would be tough to confirm its existence.

Gravity Probe B follows a polar orbital trajectory to distinguish between both effects.

It is interesting to note that back in 1920, Einstein did not categorically deny the existence of aether –he even said that in

his model, space-time itself could be an aether. However, **Mach's principle** seems to be quite at odds with relativistic philosophy. In fact, dragging of mass by a gravitational field is not particularly relativistic if one considers that it does not refer to space-time curvature –and thus, a trajectory along geodesic lines– but to mass being dragged by something. This something seems similar to the concept of aether.

However, NASA presents the results from Gravity Probe B as another confirmation of *General Relativity* (see image). Nevertheless, as we shall see below, this experimental confirmation also supports *Global Physics'* non-relativistic proposal.

Before analyzing the nature of effects confirmed by satellite Gravity Probe B, one should recall what *Global Physics* states regarding the concept of aether and the possible dragging of mass and energy.

1. There exists a partial dragging of mass by global, gravitational or kinetic aether –**reticular structure of matter**–, which is like the inverse of general movement because the privileged reference frame for movement of mass is the kinetic aether.

The reticular structure of matter supports the mass, gravitational field and **kinetic energy**.

2. **Luminiferous aether** –gravitational field– is a dynamic property of global aether. Luminiferous aether completely drags light; however, one should consider that gravitational fields are additive, and the effective drag of light will be the resulting drag from its gravitational components.

Consequently, *Global Physics* not only accepts the *Lense-Thirring effect* on electromagnetic energy but also –as the gravitational

field corresponds in this model to luminiferous aether— it could also explain the *Michelson-Morley* experiment on the Earth's surface in a non-relativistic way.

The Lense-Thirring effect for electromagnetic energy allows explaining properties of X-Ray jets and other particles near black holes. It also offers corrections to the **light curvature** effect produced by stars.

Regarding results of the Gravity Probe B:

- **De Sitter effect or geodetic precession**

According to Wikipedia, this effect corresponds to the explanation for the anomalous precession of Mercury.

**Paul Gerber** first explained it in 1898 within a non-relativistic model, then by *General Relativity* in 1916 using the same formula, and more recently by *Global Physics* using the simplified approximation of a circular orbit. Of course, the interpretation of the mathematical formula differs for each of these three theories.

The non-relativistic proof by *Global Physics* is on the page regarding **Mercury's orbit** from the book *Law of Global Gravity*. This law explains the *de Sitter effect* in an alternative way, as it incorporates a modification of Newton's *Gravity Law* using a small increase in centripetal acceleration due to kinetic energy.

- **Lense-Thirring precession on mass**

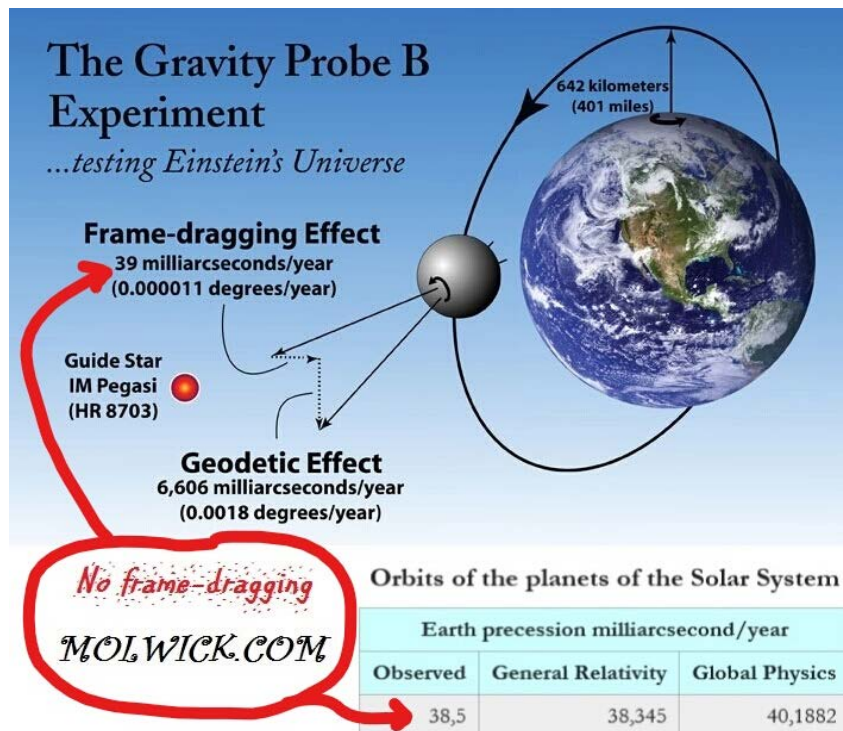
This effect states that a rotating mass provokes a rotation of its gravitational field, and consequently a dragging effect on the mass of an object in orbit.

According to *Global Physics*, a gravitational field is not the aether of mass; thus, rotation of a gravitational field does

not imply rotation of **global or kinetic aether**, and so it will not drag gyroscopes.

## Lense-Thirring effect and geodetic precession

(Public domain image)



On the other hand, the empirically observed precession is due to translational movement of the gyroscopes around the Sun. In other words, the cause is the geodetic effect of their solar orbit, similar to the effect, which causes anomalous precession of Mercury, but in this case affecting precession of the Earth.

The solar orbit of satellite Gravity Probe B derives from its inertia and the Sun's gravitational field and not by the Earth's gravitational field or its rotation –though it modulates this orbit and gives it a sinusoidal form.

What's more, in the case of Mercury, the Earth or any gyroscope in a solar orbit, the precession of its solar orbit



due to geodetic effects will produce the same precession concerning its axis of rotation. One could assume a similar explanation might apply to previous experiments that confirmed mass dragging from Lense-Thirring.

Likewise, this proposal is consistent with the polar orbit of the satellite. As it is in a plane almost perpendicular to Earth's solar orbit, the plane of the supposed geodesic line along which it moves –as well as its precession– is almost perpendicular to the precession of the expected Lense-Thirring dragging effect. Here, we use the term “almost perpendicular” because the expected dragging due to the gravitational field would be perpendicular to the axis of rotation of the Earth, while the geodesic effect would be in the plane of the polar orbit, which is almost perpendicular to the ecliptic plane.

A weird aspect of all this is the correct relativistic prediction of dragging of mass from the Lense-Thirring effect; however, at no moment is the solar orbit of gyroscopes or the Earth mentioned in presentations of this mission or its results.

In any case, it would not be the first time that justifications or arguments that are not entirely correct give quantitatively correct results.

The documentation of Gravity Probe B mission also fails to mention the quantitative coincidence between Lense-Thirring effect upon gyroscopes and *de Sitter effect* or geodetic precession of the solar orbit of the Earth.

To sum up, the following points endorse the proposal put forth by *Global Physics*:

- Previously established characteristics of global or kinetic aether and luminiferous aether

- Effects of gravitational fields are additive and do not cancel
- Logical correspondence between precessions of planetary orbits and the axes of gyroscopes
- Quantitative coincidence of supposed Lense-Thirring effect upon axes of gyroscopes with the precession of Earth's solar orbit

As the image shows, both supposed Lense-Thirring effect upon gyroscopes and geodesic precession of the Earth in its solar orbit are around 39 milliarcseconds/year.

- The simplicity of the calculations performed, as in this case, it is not necessary to make use of Kerr's metric.

Other experiments regarding planetary orbits are about the abovementioned anomalous **precession of the perihelion of Mercury** of this book and the **Paradox of the Relativistic Dolphin** from the book *Global Astrophysics and Cosmology*.



When **Don Magufo** finishes the book,  
he calls up **M<sup>a</sup> José** very happily to tell her.

She says:

–Very good, what I most like is the **Merlin** effect,  
but don't forget that the most important thing  
is to know one's own limits,  
*Even if there aren't many! –*

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