EL TIEMPO PITAGÓRICO

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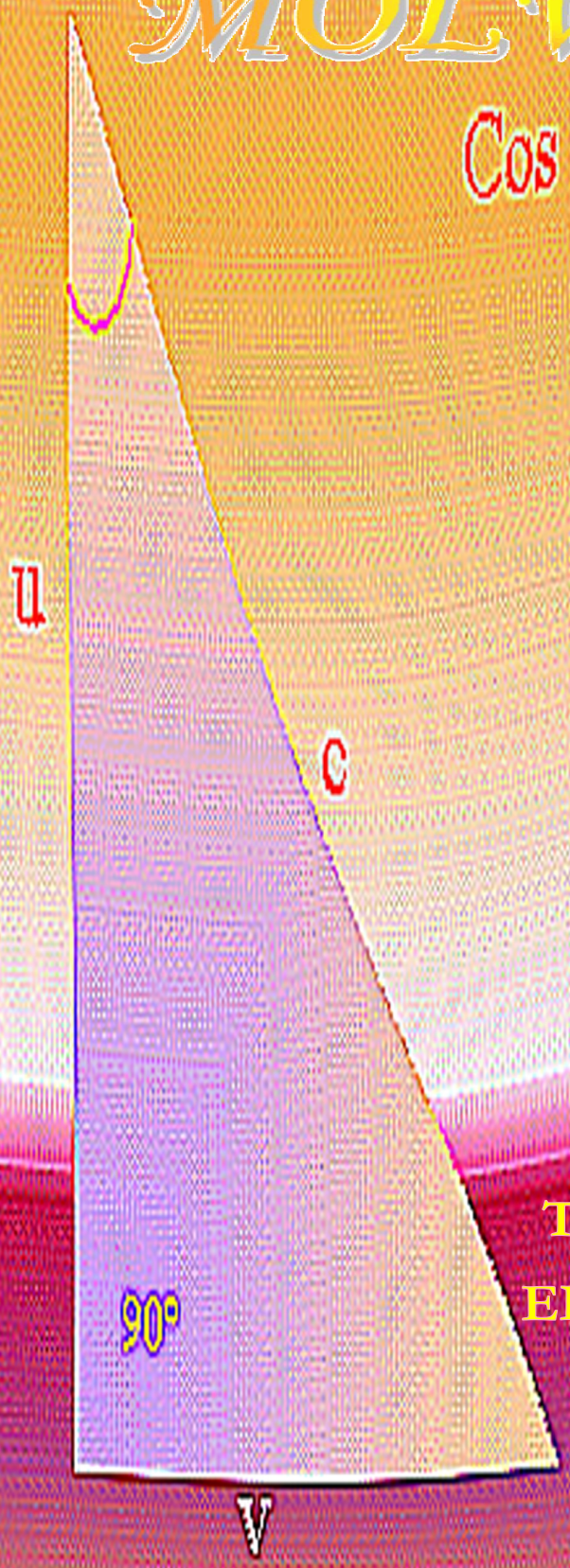
$$\cos \alpha = u / c = (1 - v^2/c^2)^{1/2}$$

$$t = t_0 / \cos \alpha$$

$$t = t_0 * \gamma$$

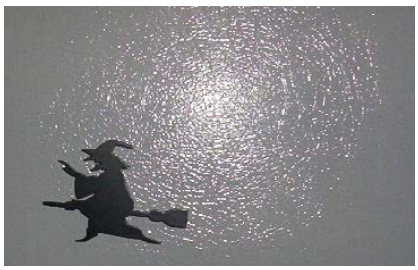


GLOBAL METAPHYSICS

THEORY OF RELATIVITY

ELEMENTS AND CRITICISM

José Tiberius



GLOBAL EDITION

Hobbies: chess, padel and philosophy among others

José Tiberius is the main author of Molwick publisher books.

With over 40 million visitors and two million books downloaded in PDF format, he is surely one of the most widely read authors in Spanish of scientific essays in the current millennium.

There are more than 10000 links to Jose's website, where his books on theoretical physics, theory of evolution, quantitative genetics, cognitive theory, and philosophy of science, metaphysics and children's stories are showcased in five languages. Many of these links –to all these different fields– come from universities, projects done by university students and blogs created by teaching professionals and Educational specialists.

Moreover, it is interesting to note that these links are usually together with links to Wikipedia or pages such as National Geographic.

♦

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

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Tittle: Theory of Relativity, Elements, and Criticism
eBook: 978-84-15328-81-0
Paperback: Physics and Metaphysics of Time
Vol. I - II: 978-84-15328-84-1 // 978-84-15328-80-3*
(Book series) Global Physics
978-84-15328-78-0 // 978-84-15328-79-7*

Editor: Molwick
5th edition: November 2017
Author: José Tiberius

MOLWICK

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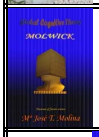	*Global Cognitive Theory (Book series)*	978-84-15328-73-5 978-84-15328-74-2* 978-84-15964-00-1**
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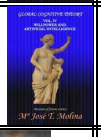	*Willpower and Artificial Intelligence*	978-84-15328-17-9
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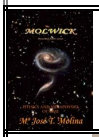	*Physics and Metaphysics of Time*	978-84-15328-84-1 978-84-15328-80-3* 978-84-15964-02-5**
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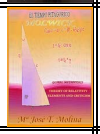	*Theory of Relativity, Elements, and Criticism*	978-84-15328-81-0
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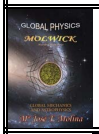
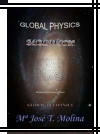
	*Global Mechanics and Astrophysics*	978-84-15328-37-7 978-84-15328-83-4* 978-84-15964-03-2**
	*Global Mechanics*	978-84-15328-35-3
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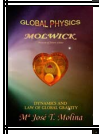	*Dynamics and Law of Global Gravity*	978-84-15328-91-9 978-84-15328-86-5* 978-84-15964-04-9**
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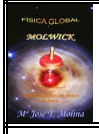	*Global Physics Experiments*	978-84-15328-88-9 978-84-15328-89-6*
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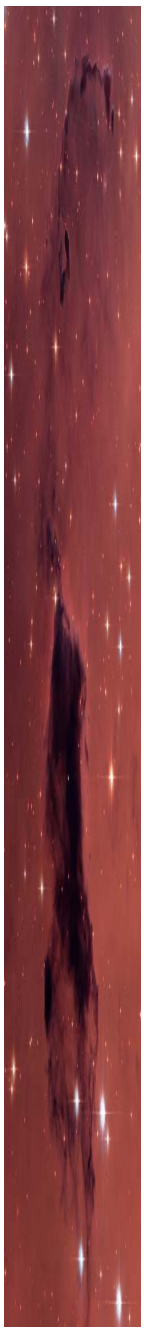
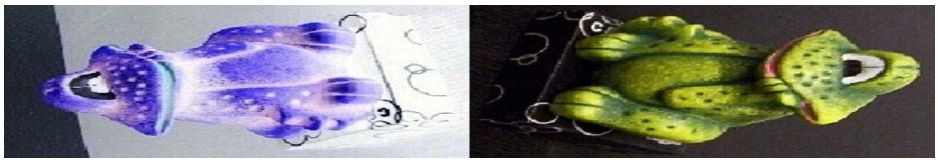
VOL. II THEORY OF RELATIVITY, ELEMENTS, AND CRITICISM PAG.





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GLOBAL METAPHYSICS

VOL.
THEORY OF RELATIVITY, ELEMENTS, AND CRITICISM

I. ALBERT EINSTEIN'S THEORY OF RELATIVITY

Albert Einstein developed the *Theory of Relativity* in two stages or different physical theories. The first one, *Special Relativity (SR) or restricted relativity,* establishes relativity of time. However, the second is necessary: *General Relativity (GR),* written to solve numerous holes in the first theory, both conceptual and experimental.

One could say that *Theory of Relativity* is comparable to a building, where the first few floors correspond to *SR* and the higher ones to *GR*.

Although technically *General Theory of Relativity* (1916) includes the *Theory of Special Relativity* (1905), in many cases this terminology indicates the two main parts of relativistic physics.

Despite the lack of foundations in the building, I aspired, as many people have, to understand these famous physics theories, only because of the love for science. I believe I have managed it. Besides, I did confirm the first impression, and I have come to the conclusion that both SR and GR are mistaken as far as the poor time is concerned, and by extension, quite a few more things.

At the same time, I should emphasize that, when taking into account the definition of a second of 1967, Einstein's theories are formally correct. The interval of time, which configures the unit of time, modifies with changes in gravity, or in the speed of the atom of Cesium, to which it refers.

If it is difficult to understand these theories, it is even more so

to criticize them or to understand the criticism. A satire of the unknown will always be weak. Therefore, I have tried to present its content briefly from an orthodox point of view before explaining the counterarguments.

What is much worse is to criticize Einstein's two theories for being contradictory, given that, what one does not affirm the other one does, and vice versa. They are like twin theories not getting along.

Some of the main characteristics of this book are the following:

Museum d'Orsay Clock - Paris

- **Goal**

  Undoubtedly, the *theory of relativity* overall is one of the most complex theories in the history of science. Together with Darwin's theory is also one of the most controversial, despite the number of experiments that have supposedly confirmed it.

  Besides the AMEISIN relativistic writing style of Albert Einstein, he uses many thought experiments. Furthermore, it means a change in the model of the physical reality, which implies various areas or sub-models, some of which are correct, but others are not. In a more general sense, the *relativitas causa* would be a collection of so-called *misleading coincidences*.

  The goal of this book is to reveal that explanations about

the *Theory of Relativity* are inadequate, if not wrong; contributing to the widening of a pre-existing rift between *Modern Physics* and society knowledge. There is an attempt to develop a destructive criticism while, in some way, still acknowledging its positive points.

The idea is to point out weakest aspects of relativity and to present interpretations of events of the physical reality more consistent with common sense, to propose *Global Physics* as a new theory of everything, with specific experiments to confirm it. These include the experiments Gigachron and Distant Michelson-Morley, equivalent to LISA experiment of ESA –before of NASA.

It is funny that, on the one hand, the *Theory of Relativity* itself is not as wrong as explanations given by its defenders, and, on the other hand, it is much worse than they could imagine. In fact, it has some aspects that are correct, because they are conventionally consistent. For example, time, as currently defined, is relative; but what does not make much sense is the official definition of the unit of time being sensitive to gravitational field or speed, since it would have been logical to establish it including, among the others, these two specific conditions.

- **Readers**

This book directs mainly to people interested in relativity, but not necessarily physicists. However, I do hope that it is also useful to the latter, so that they may rethink certain aspects of this theory; particularly those directly derived from the supposed *relativity of time and space*.

Some people who are knowledgeable about relativistic physics will inevitably find themselves uncomfortable with the reading and will desert it. I do expect, however, that

this will not be due to the style of the book, but due to a refusal to admit the possibility that principles of relativity are entirely misguided. It is a reasonable and respectable refusal, bearing in mind the time elapsed from their formalization and practical unanimity in scientific doctrine.

Speaking of experts on Albert Einstein's *Theory of Relativity,* if the reader is one of them, perhaps he or she might be able to answer the following question: *From when has Theory of Relativity been formally correct?*

Other interesting questions could be *why is there a lag in atomic clocks on board a spacecraft? Could it be a measurement error or that the clocks become altered by magic? Indeed, what internal mechanisms make a clock desynchronized? Does gravity exist, or is it merely a mathematical property of nothingness?*

If the reader is not an expert on relativistic physics, the previous questions made to someone who is maybe encouraging.

What is paramount are basic intuitive concepts rather than complex formulae, given that if the former is lost, the latter cannot tell us anything at all –or in any case, anything we could understand.

- **Style**

If one says that the book *The Equation of Love* involves both science and metaphysics, one could say that this book also involves a certain amount of humor. It is not by personal choice, but because, when one is talking about continuums and new dimensions in relativistic physics, and I start thinking about how science attempts to justify itself in non-existent dimensions, I cannot help but smile a little at the induced crossing of ideas.

In consequence –and to live hardness of the reasoning behind the relativistic principles– the style is at times rather informal.

We should not forget that new theory of everything encompassed by *Global Physics* has a markedly scientific character, as it proposes feasible physics experiments.

- **Content**

  The aspects of this book, which criticizes relativistic physics, are the following:

  - In the introduction, while trying to understand the folly that occurred, a list has been included, comprising of *misleading coincidences* and *paradoxes of cousins,* which contributed to the acceptance of the *Theory of Relativity,* despite its unfortunate mistreatment of time, space, and our neurons.
  - Historical context upon which the relativistic principles developed and their immediate precursors.
  - There is a brief description of postulates and principles of relativity, such as notions of the frame of reference, inertial systems, the relativity of time and space, and relativistic mass.
  - Criticism on aforementioned postulates and principles
  - Most common errors contained in the innumerable demonstrations of relativistic physics with mainly thought experiments.
  - A brief section dedicated to *General Relativity,* which claims to eliminate classic twin paradox, but instead generates its own paradoxical complex of incredibly complicated mathematics, and implicitly recognizes that

Special Relativity is erroneous.

After so much destruction and massive confusion over whether the speed of light is or is not, I hope that the reader understands better *Modern Physics* and its weaknesses. Also, the flaws when talking about healthy relations between space and time –the classical definition of velocity–, and between gravity, mass, and energy, as general properties of matter.

* * *

II. SPECIAL RELATIVITY

Before discussing the law of restricted relativity, it is useful to situate its historical context:

- 1896 – Discovery of natural radioactivity by **A. H. Becquerel**
- 1897 – **J. J. Thompson** discovered the electron
- 1900 – Hypothesis on energy and quanta by **Max Planck,** which is the origin of Quantum Mechanics
- 1905 – Theory of Special Relativity by **Albert Einstein**
- 1913 – Atomic model of **N. Bohr**
- 1916 – General Theory of Relativity by **Albert Einstein**
- 1924 **– L. De Broglie** proposes the wave-particle duality of matter
- 1926 – **E. Schrödinger** proposes his wave function equation for the Hydrogen atom
- 1927 – **W. K. Heisenberg's** uncertainty principle
- 1932 – **J. Chadwick** experimentally discovers the neutron
- 1942 – First chain nuclear reaction in a nuclear reactor, conducted by **E. Fermi.**

A first idea presents itself immediately; Einstein's *Special Relativity* was truly an audacious theory.

At the same time, and without taking away the negative recognition from restricted relativity, we realize that Einstein's theory was not so original the moment it emerged. However, the process overall was very revolutionary, to which I would add *Unlucky and a bit desperate!*

In this book, there are two sections before the systematic study of Einstein's *Special Relativity*. In the first one, *what is relativity?* I present a list of *misleading coincidences,* and *paradoxes of cousins,* as a small summary of why SR was accepted. Also, I give my concept of SR as a form of foregone conclusion, so that the reader may start understanding the philosophy of the present book.

Second section deals with **Maxwell** equations, **Lorentz** transformations, and **Poincaré** postulates as immediate precursors to relativistic physics. Together, and in the context above, they form the group of ideas that triggered the erroneous interpretation by **Albert Einstein** and the scientific community of the Michelson-Morley experiment.

In the book of short stories, *The Story of Grandmother Ino* is about the historical context of the *Special Relativity*, using plays on words, such as experience being the mother of science. Also, it is a story of fear and mystery because of the path chosen by modern science in the last century.

Of course, many other mistakes exist, the will appear in the analysis of each principle of Einstein's *Theory of Special Relativity* classified in the section of this book entitled *Errors of relativistic physics.* However, I am convinced that said errors would not have happened, or would have been overcome without difficulty if it had not been for the interpretation above of the *Michelson-Morley experiment.*

In the third section, besides the postulates of the Theory of Special Relativity, I discuss its elements with a neutral presentation, to have a basis upon which to direct my criticisms. Moreover, I am always trying to limit the use of mathematics, and explaining the technical meaning of the words.

In particular, two aspects will be touched upon. On the one hand, the problem induced by some terminological elements or concepts most used, because of confusion, complexity or both. On the other, I will point out specific inaccuracies and erroneous interpretations of experiments –especially thought experiments–, upholding *Special and General Relativity* today.

Those who wish to delve deeper into Einstein's theory will not have any problem if they consult any introductive book to *Modern Physics*. I would recommend books from the previous year to university, the first year of the university, or popular science books; as I fear that more specialized books on restricted relativity can be too convoluted, and can focus on the mathematics, or thought experiments, given that the space without gravity does not exist.

On the Internet there is also an abundant Webography dedicated to restricted relativity.

II.a) What is relativity?

It is a scientific theory! In arguments explaining what relativity is, there is usually a mention of the scientific method; which is to say, every theory –though it may be generally accepted– can be flawed. *What a coincidence!*

Moreover, as if it was a fairy-tale, they add that a new theory must always include the previous one as a particular case. Incredibly, they seem to forget the current state of the *Ptolemaic system* –famous theory affirming the Earth was the center of the universe–. Undoubtedly, this is another expression of the ignorance culture. I suppose they are trying to convince themselves, although they do not seem to quite manage it.

Time is relative because of the *Theory of Special Relativity* of 1905, and subsequently, because of *General Relativity* (RG) of 1916. However, the latter affects time by establishing the principle of equivalence between gravity and accelerated systems and thereby assigning gravity the temporal effects of movement in *Special Relativity*.

Let us briefly mention a collection of coincidences and the paradoxes of cousins –confusing concepts or terminology– that made possible an interpretation of *Modern Physics,* so erroneous that it forced modifications in the philosophy of science.

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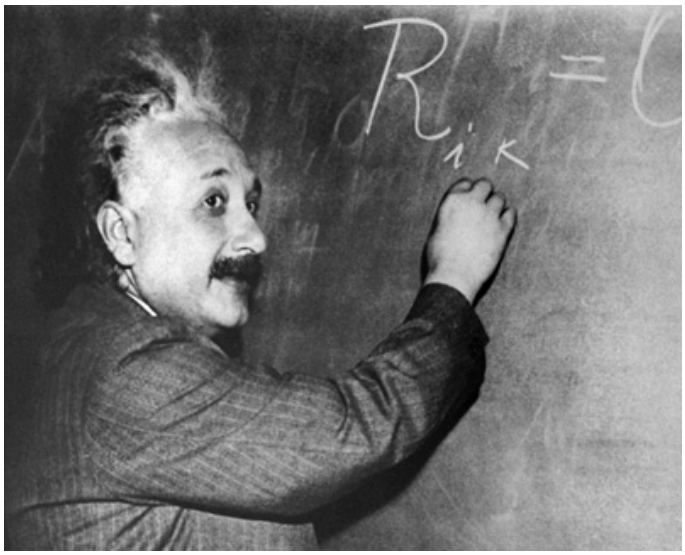
science.

- **Misleading Coincidences**
  - The philosophical difficulty of admitting the drag of light by the Earth –luminiferous aether, gravity field or tension of longitudinal curvature of the global aether–, by supposing a return to geo-centralism, which provoked so many headaches in the development of modern science.
  - The real subjectivity and imaginary relativity of time
  - Inexperience at the beginning of last century, and its mother, innocence, which would be the great-grandmother of science
  - Tendency of science to keep advancing, or at least, not to move backward
  - Coincidence of the frame of reference of Earth with the natural reference frame, or privileged frame, of light on Earth –Einstein's *General Relativity* establishes this characteristic without saying it explicitly.

Albert Einstein (1879-1955)

(Public domain image)



- There is something similar to relativistic mass, and the mass-energy equivalence, albeit a partial or contextual equivalence.
- Pythagoras's theorem, Lorentz's equations, and the quantifiable relation between mass and speed or kinetic energy
- The mathematic complexity of the relativistic model, mixed with an excessive philosophical influence, which provoked a resentment of the scientific method and the loss of essential common sense, when talking about the predominance of reason over usefulness.
- The correlation of professional interests with abstraction increase in this matter
- The ameisin writing style of Albert Einstein, and his intuitive control of mathematics
- The real effects of gravity on the mass and electromagnetic energy mathematically expressed in *General Relativity* and its concatenation to the most incorrect point in *Special Relativity*.
- The attraction associated with time-travel and the idea of immortality.

- **Paradoxes of the cousins**

  Of course, all these paradoxes have an explanation, though it may be somewhat convoluted. Also, if one does not accept them, it must be because one does not understand *Relativity,* rather than because it is badly explained or does not make any sense.

  - *Convincing the brain that what is white is black is not an easy task*

    For example, the fact that one meter is larger than another is, or that the duration of a second is longer than another is.

    Also, this length or duration depends on the angle of observation. The brain ends up not knowing what we are talking.

    Alternatively, even that space and time are interchangeable.

  - *The use of the word postulate in the sense of axiom*

    The usual meaning in the philosophy of science is usually the opposite; something proposed that one must prove. Of course, particular connotations may vary with different languages.

    - Definition of the second

      Since 1967, Wikipedia has defined the second as the time that a Cesium atom takes to do 9,192,631,770 periods of radiation.

This definition is consistent with Relativity; when the atom is moving on Earth, it takes less time, which it also does if it is on a lower point or a point with more gravity. That is to say; the second is shorter.

I do not know why, but *Wikipedia* also says that this duration is more stable than the previous definition of the second, which referred on the orbit of the Earth and was of an absolute nature.

However, on the BIPN * Web page, it says that the Cesium atom must be at rest. In this case, time would cease to change with acceleration, and the *Theory of Relativity* would be false. Therefore, we have a definition and modification with opposite meanings. It is a nice adaptation; it must be Darwin's influence.

- Definition of the meter

  In Relativity, the speed of light is not an experimental measure; its quantification is an axiom. Moreover, the distance light travels in a second divided by 299,792,458 parts is a meter. In fact, the distance traveled by light in a relative second is variable.

  Consequently, it seems that no one saying the constant speed of light is an experimental fact knows what he or she is talking.

◦ *Electromagnetism and relativity*

Maxwell deduced the speed of light in a traditional frame, and about the properties of a supposed aether. However, usually, people use his deduction as proof of

the axiom of light maximum velocity, which does not need proof.

- *Reference frame*
  - The definition of two inertial systems means one is in uniform relative movement with respect to the other, but people constantly talk about an inertial system without any relation to another, which does not make much sense.
  - However, it makes sense when we are talking in terms of GR, but people use the inertial concept in the first explanations of SR.
  - Moreover, in GR the definition of an inertial system has not only changed, it no longer needs another system of reference.
  - By the way, the word "inertial" does not adequately represent the concept in both SR and GR, given that a system of reference does not have mass or inertia, as it is an abstract concept.
  - Reference systems are also called observers, when in normal conversation; an observer is external to a system.
- *Thought experiments*

  These thoughts are anything but experiments. In fact, they clearly show the lack of real experiments, and often, the conclusions are included in the premise, or hypothetic results are erroneous.

  Being positive, they present a logical, but partial aspect of supposed reality, and a conclusion, which comes with an unwarranted scientific generalization.

- *Light does not have mass or physical support*

  Typically, something with these characteristics is an abstract concept that cannot produce physical effects, so we should call it dark light or dark magic.

- *Invariant mass*

  So, where do these much-used expressions, such as relativistic mass and rest mass, come from?

  Of course, mass is invariant because its measurements are always at rest. I.e., for the definition of the unit of mass, the condition of zero velocity is a requirement. When for the definition of a second it is not because it is said absolute rest does not exist.

  The trick is to consider a mass in motion as part of a bigger system and to calculate the proper mass of the system as a whole.

  Kinetic energy has an equivalent mass, but it is not mass. Physicists do not know what it is, but they know that it is not at rest.

  One has to admit; these concepts are brilliant.

- *General Relativity*

  - It opposes SR in almost every way. If SR does not explain something, GR does it.
  - It contradicts and limits SR by imposing a privileged reference frame without saying so in many cases.
  - It is less general than SR because equations only have a local solution.
  - It confirms predictions that are not predictions.

GR confirmed predictions experimentally with already known values. It tried to cover up GR is partially an ad hoc mathematical theory.

- *Doppler Effect of light*

  If the speed of light is constant and maximum, the existence of its Doppler Effect it is weird.

- **My concept of Special Relativity**

  The two postulates of Albert Einstein's *Restricted Relativity* (SR) are purely mathematical and very elegant. They are a subtle way of saying what he wants to say, whilst maintaining a high level of obscurity.

  Hiding the weaknesses with artificial complexity is necessary. For example, where does maximum speed in the whole universe come from? How can it be that the speed of light is c when measured from the Earth and that c is the speed of the same photon measured from the Sun, despite Earth's relative speed to the Sun?

  Why is it so good that, for each point of the universe, units for the majority of magnitudes in the *International System of Units* represent different physical realities?

  Another example of simple concepts, the second postulate of the *Theory of Special Relativity* could mean formulae for the laws of physics are expressed the same in English, Spanish, and all other languages. After all, mathematics is another language.

  In this case, we would have no choice but to make relative English words, Spanish words… In addition, we would have to make relative adjectives, adverbs, and other minor grammatical structures.

  If we find any problem with meanings obtained by applying the appropriate terms, we could always resort to making relative the linguistic structure. For example, we could use a small geometric defect in grammatical books, or simply by tearing out the pages, in case of a slight physical or mental desperation.

Careful! It is easy to get confused sometimes!

Without the **Michelson-Morley** experiment, I do not think Einstein's relativity would exist. My interpretation of the results of this experiment is that light moves on gravity field –tension of longitudinal curvature of the reticular structure of matter–, as if this structure were, in some way, luminiferous aether sought after by classical minds, but with other characteristics, such as being a mobile aether.

To demonstrate the existence of the luminiferous aether, I have proposed an experiment, "Distant Michelson-Morley" (DMM), because it would be like the Michelson-Morley experiment, but at a distance from Earth's gravitational field. The same experiment LISA, but with different objectives, was scheduled to be carried out, before by NASA and now by ESA.

The results of the DMM should be the opposite of the *Michelson-Morley experiment,* and the same results predicted by the classical minds, although the explanation would be different.

It is true velocity and gravity share many physical characteristics, but this does not mean they are identical.

I think restricted relativity (SR) is a consequence of multiple errors in the interpretation of reality, brought about by numerous coincidences. Among them, the mass-energy equivalence, and the omnipresent inverse square law stand out.

I suppose *Special Relativity* will disappear without another theory taking its place, given that all it does is obscure the reality with complex mathematics. Moreover, whenever its flaws or contradictions are obvious, the elucidation passes

to GR, as in the paradox of the twins.

Current orthodox has only the GR in existence, though GR does contain SR as a partial analysis.

In other words, what will remain from the *Theory of Relativity;* will be the more or less correct part of the relativistic mass, and the effects artificially explained by *General Relativity,* which will obviously move towards a more rational justification.

The new *Global Physics* is a theory of everything. *Global Physics* attempts to lay a new paradigm defining time, energy, and other concepts without making them relative, or adding spatial dimensions.

A significant advantage of the disappearance of Albert Einstein's theories will be that scientific minds will go back to being much more intuitive, and we all will cease wasting an enormous amount of brain energy.

II.b) Precursors of the Theory of relativity

At the end of the 19th century, Classical Mechanics from Newton and Galileo's relativity worked reasonably well. However, there were still things that did not quite fit; there were still things that did not quite fit, such as electromagnetism topics, nature of light or electromagnetic waves, their speed, and the elemental structure of matter.

These intriguing areas of physics impelled scientists to cultivate new solutions. One could say that nowadays the same is happening with other problems. Maybe it has always been that way.

By comparison with the rest of known types of waves, it seemed that electromagnetic waves needed a material through which to propagate.

This model based on the concept of aether, a supporting medium of light. To confirm the model, they hoped to find the absolute velocity of an object dependent on a universal frame of reference, given that the Earth was no longer the center of creation, and the Ptolemaic system had long since been discarded.

II.b.1. Maxwell's equations of the movement of electromagnetic waves

Maxwell's equations describe the movement of electromagnetic waves. Given that it is a wave motion; Maxwell's equations incorporate an undeniable mathematical complexity due to the sinusoidal waves form.

In 1869, Maxwell's equations made the possible theoretical calculation of the speed of light or electromagnetic waves in general. His equations drove scientists of the time to search for elements that would strengthen the classical model and would incorporate the dynamics of light propagation.

Hertz, in 1887, confirmed experimentally the speed of light determined by Maxwell's equations.

What no one expected was that, what Maxwell had calculated for a supporting medium of light with a concrete set of conditions, would end up integrated as a postulate or axiom of *Special Relativity,* independently or without needing a medium.

While aether remained undetected; they assumed its non-existent; the final error came with Einstein's *Theory of Relativity* and its interpretation of the Michelson-Morley experiment.

In other words, he included propagation of electromagnetic waves in vacuum independently of its conditions. Curiously, he later incorporated a different effect of the condition of gravitational intensity using the *Equivalence Principle* in *General Relativity*.

On *Wikipedia,* I saw something interesting that I have heard many times. It said that Maxwell's electromagnetic wave

equations predicted a wave that, contrary to the ideas of the time, did not need a medium for propagation. This electromagnetic wave could transmit in a vacuum due to the mutual generation of electric and magnetic fields.

I have finally understood the error in this affirmation; in Maxwell's time many things were thought of, some correct and others not. In this case, they accepted a priori the content of the incorrect notion of the electromagnetic wave equation, and therefore the conclusion was just as incorrect. In other words, on the one hand, they did not accept that a wave needs a supporting medium through which to propagate, and on the other, they embraced the incorrect idea –electromagnetic waves transmitted in a vacuum.

The idea about a mutual generation is better not to comment. At least, it was an ingenious idea.

Global Mechanics understands the so-called electric field and magnetic field of the electromagnetic wave equation as the perpendicular components necessary to define torque. Torque is in the perpendicular plane to that of the direction of wave propagation. In other words, the difference between magnetic and electric field is entirely conventional and for historical reasons.

Of course, it was not only in Maxwell's time but also in almost the whole of the 20th century –and indeed, even now– that scientists still confuse vacuum with nothingness –like on *Wikipedia*–. However, some quantum theories are beginning to recognize openly that classical vacuum is not as "empty" as thought.

Moreover, a dangerous epistemological problem of the philosophy of science acts. In order to accept a proposition, the argument is that because its acceptance in the past, it must

be true now. Interesting indeed!

In the section *Properties of light waves or photons* of the book *Global Mechanics,* I explore the relative movement of electromagnetic waves and Maxwell's equations more in-depth.

II.b.2. The Michelson-Morley experiment

I would like to remark that I do not argue or deny the validity of this grand experiment in its technical aspects. Its premises and physical interpretations are another matter, however.

On this page, there is the description of the physical experiment as a whole; i.e., premises, suppositions, and conclusions. On the one hand, I discuss suppositions of rest and relative movement concerning a luminiferous aether. On the other, I mention the orthodox interpretation of one of the core experiments in *Modern Physics,* as well as the alternative offered by *Global Physics*.

This experiment is crucial –together with the predictions of *General Relativity*–, as it is the main support of Einstein's *Theory of Relativity*.

The 1887 *Michelson-Morley experiment* attempted to confirm the classical model of luminiferous aether.

This model assumed the following premises:

- Light needed aluminiferous aether to travel.
- The luminiferous aether had to be at absolute rest.
- The speed of light is independent of its source.
- The speed of light is constant in vacuum.

Michelson and Morley devised an instrument capable of detecting the speed of the Earth regarding luminiferous aether at rest and, in this way, of obtaining a reference frame in absolute stillness.

The following figures show the hypothetical journey of light in

their physical experiment. The idea consists of comparing the two possible situations of relative motion of the interferometer concerning the supposed luminiferous aether.

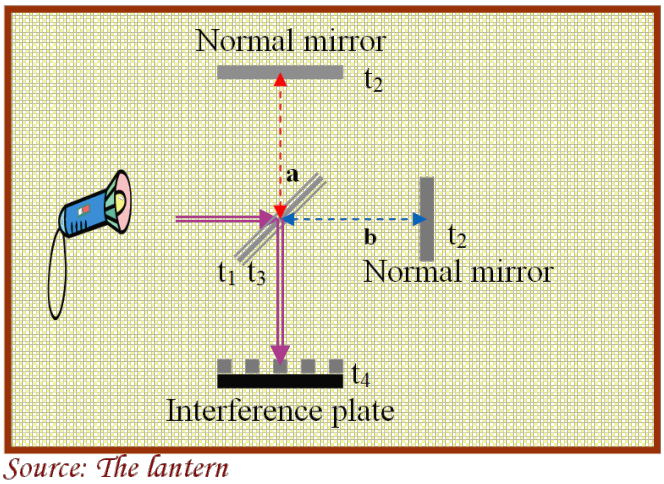
1. **Interferometer of Michelson and Morley at rest and theluminiferous aether**

   Light comes from a torch towards a semitransparent transversal mirror, in such a way that some rays go through it (instant **t_1),** and continue their straight-line trajectory until they get to a non-transparent mirror (instant **t_2).** Also, other rays other rays of light deflect upwards until they get to another non-transparent mirror (instant **t_2)**

   Given that distances "a" and "b" between the semitransparent, and the regular mirrors –above horizontal and right vertical– are equal, the light will reach these mirrors simultaneously (instant **t_2),** and it will return in both cases towards the semitransparent mirror.

Michelson-Morley experiment

Rest with respect to luminiferous aether



Source: The lantern

   Because of research design, the different light beams of the instrument will reach the semitransparent mirror again at the same time (instant **t_3),** and both will be deflected downwards, ending up on a plate (instant **t_4)**

   On the lower plate, there will appear the interferences between the two beams of light. The meaningful part of

this physics experiment would not be the interference pattern, but the fact that this pattern would not change when the whole apparatus of the interferometer turns, given that distances traveled are equal, and speed of light seems constant and independent of its source.

2. **Michelson Morley interferometer in relative motion to luminiferous aether**

   The intention was to measure differences in the time taken by light to travel equal spaces between various mirrors. Given that some mirrors line up Earth direction and others are perpendicular; time should change due to Earth's velocity.

   The second figure shows light path when the mirrors are solidary with the Earth, and they move in relative motion concerning the supposed luminiferous aether. In this figure, there is an exaggeration of the velocity of the mirrors regarding the speed of light, to be able to visualize variations in distances produced by movements of the mirrors. However, the reasoning remains the same.

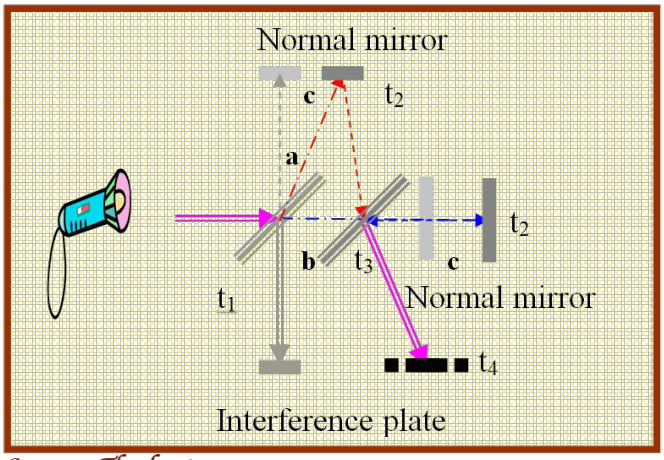
3. Not to make the explanation too long and cumbersome, let us see the following case. Instant $\mathbf{t_1}$ will be as in the first figure, but instant $\mathbf{t_2}$ will be after its corresponding moment in the first figure because distance "b" will have increased the amount "c" with the shift of the non-transparent mirror –vertical mirror– in the direction of the Earth. This distance "c" is due to the time that the light takes to cover the distance "b" plus the time it takes reaching the vertical mirror.

   Likewise, distance to the upper mirror will increase, but this distance will be the geometric mean of "a" and "c" according to Pythagoras theorem. In other words, increase

in the distance will depend on the angle of the initial direction of the speed of light and the new direction towards the upper mirror.

Interferometer of Michelson-Morley

In motion with respect to luminiferous aether



Source: The lantern

As we can see, the two distances traveled by light beams will no longer be equal, which will also happen on the way back to the semitransparent mirror. Therefore, there will appear variations in the interferences produced between the two light beams.

Consequently, successive changes in the angle of disposition of the interferometer concerning the direction of the Earth should reflect the associated variations in interference fringes in the plate.

Calculation of distances and their variations with the angle of motion and the interferences produced does not cause a problem. Moreover, it should have given the relative speed of light regarding luminiferous aether.

However, this empirical experiment gave no variation on the interference fringes in the final plate with changes in the angle of the interferometer. In other words, the light behaves identically in both cases.

4. Result and interpretation

Let us see two slightly different interpretations of this experiment, though both accept the experimental results entirely.

- *Orthodox Modern Physics*

  Now, the experiment design considered the instrument in relative motion concerning luminiferous aether, as it would be on Earth, which has a speed of approximately 30 km/s in its orbit around the Sun.

  The result of this scientific experiment was utterly unexpected. Interference fringes did not vary at all when turning the interferometer. It was the predicted result in first scenario analyzed, where the Earth was supposed to be at rest with respect to luminiferous aether.

  Instead of resolving the problem of the speed of light, it heightened it.

  Consequently, the ephemeral luminiferous aether was lost indefinitely, as it was the primary goal of Michelson-Morley experiment and technical goodness of the experiment was clear.

  The search for an explanation of the weird behavior of light was starting. Desperate times call for desperate measures: The *Theory of Relativity*. Although Einstein said, he did not know the experiment! Who knows? It could have been a joke!

- *Global Physics*

The interpretation of *Modern Physics* in general –and of the *Theory of Relativity* in particular– is erroneous, because it contains an implicit generalization, as it assumes the correction of the theoretical premises of the initial research. If these premises were partially incorrect, deductions based on them would also be a flaw. In other words, the fact that a fixed or absolute luminiferous aether does not exist does not prove that light does not have a mobile and non-homogenous supporting medium.

A mobile supporting medium would only be coherent if it were moving with the Earth, i.e., the interferometer was at rest concerning the mobile support –equivalently to predictions of the above supposition 1–, which sounds rather like the Ptolemaic reference system, though they are different subjects.

Consequently, they improperly generalized the independence from its source of the speed of light. I imagine it was arbitrarily not accepted or not thought of a luminiferous aether moving with the Earth. The proposal of *Global Physics* is a reticular structure of matter, elastic and unbreakable, which supports the gravitational field, and this, in turn, is the supporting medium of electromagnetic energy.

I would like to remark that the idea of a non-classical aether is not exclusive to *Global Physics,* as the well-known *String Theory* also proposes something like aether of small vibrating strings. Similarly, *Quantum Mechanics* uses the term quantum foam or quantum vacuum to emphasize that the classical vacuum is not empty. Of course, any term will do except the word aether. Even

the famous fabric of space-time will be aether if it has any mechanical properties.

Global Physics describes two types of supporting medium.

- Global aether or gravitational aether –reticular structure of matter supporting potential gravitational energy, kinetic energy, and mass
- Luminiferous ether –gravity field or tension of the longitudinal curvature of the reticular structure of matter

Moreover, the classics also spoke of two types of the carrier medium, the gravitational ether, and the luminiferous ether. For example, Descartes, his disciple Christian Huygens, and Nikola Tesla

Maxwell equations themselves include a dielectric constant of the vacuum. Therefore, there must be something provoking the physical existence of this dielectric constant. Another matter is that one may or may not want to understand the physical meaning behind the constant in the materials of vacuum and not merely the mathematical one; and if it is unknown, at least one should admit its existence.

In this topic, a parallelism with *Darwin's Theory* appears. If you say something different to the prevailing orthodoxy, everyone thinks of religion, as if there were only two colors in the universe, white and black. Of course, we all know that black is the absence of light.

Given that the Michelson-Morley interferometer is one of the most relevant experiments due to its implications in the arrival of Einstein's *Theory of Relativity,* two more

pages will be devoted to it in the book *Scientific Experiments in Global Physics.*

In section *Physics and experiments with gravity, Global Physics* proposes to do the same interferometry experiment in space, far away from Earth's orbit, to confirm one interpretation or another.

ESA's LISA project *(Laser Interferometer Space Antenna)* – before it was a NASA project– would carry out an experiment in space identical to the *Far Michelson-Morley,* though with the objective of proving *General Relativity* once more. It is funny, because I believe the result will be even more unexpected than the one obtained at the beginning of the 20th century, and will entail the disappearance of the *Theory of Relativity.*

What's more, perhaps Physics will suffer the same fate as Alchemy, so many and such big errors with the philosophical vacuum that it ended up changing its name. It could be an aspect of experimental science similar to the long-term cycles of the economy.

II.b.3. The Lorentz transformations

- **Concept of relative motion**

  Galileo's principle of relativity states that any mechanical experiment carried out in a system at rest will progress the same as in a system moving at a velocity "u" concerning the former, or in a uniform rectilinear (or linear) motion (URM).

  Let us note that relative motion and motion is the same concept, as Galileo's relativity principle states all motion requires a reference frame. Therefore, for this specific topic, the expressions *uniform relative motion,* and *uniform rectilinear motion* will be equivalent. Nonetheless, URM serves for both!

  When Galileo established that the Earth rotates around the Sun, this principle logically meant the need to re-establish validity of science regarding experiments on Earth as if it was at rest. Same as before!

  From Galileo's *principle of relativity*, we can deduce some equations of the transformation of a relative motion from one frame of reference to another (**F** and **F'**). These equations will change the origin of the reference system according to the relative displacement between the two reference frames.

  If we adjust this displacement on the x-axis, the *Galileo equations or transformations* would be those of following image.

  Lorentz equations or transformations consist of –same as the Galileo ones– establishing a mechanism of

transformation of values between frames of reference **(F** and **F')** with a relative motion with speed **u.** However, the maximum speed **c** is equal for these frames of reference. In other words, maximum speed c will not be additive when the origin of the reference frame changes.

We are not going into mathematical games with Lorentz equations to keep this simple; however, it is useful to mention that these equations imply a bi-univocal asymptotic transformation between variables space and time, maintaining the condition of maximum velocity. The only problem for relative motion with Lorentz transformations is the creation of an indeterminate point –of a purely mathematical nature– when **u = c**, which in Einstein's relativistic physics is called a singularity.

$$x' = x - u\,t$$

$$y' = y$$

$$z' = z$$

$$t' = t$$

The derivation of Lorentz equations from Pythagoras's theorem is in the pages of this book about *Space-time* and *Pythagoras's theorem* itself.

The following auxiliary constants shorten Lorentz equations:

$$ß = u / c$$

$$\gamma = (1 - ß^{2})^{-½}$$

Therefore, Lorentz transformations are as follows.

Now, **t'** is different from **t**; that is to say, conventional time does not coincide with the time measured from another frame of reference, once the corresponding *Lorentz transformations* are applied.

Lorentz showed that the formulae for electromagnetism

are equal for all frames of reference in relative motion, but only when using these transformations –put forward in 1892.

$$x' = \gamma (x - u\,t)$$

$$y' = y$$

$$z' = z$$

$$t' = \gamma (t - x\,ß/c)$$

These transformations reduced to Galileo's when relative velocity **u** or the relative motion of **S'** with respect to **S** is very small compared to maximum velocity **c.**

There are also equations to transform velocities or relativistic formulae for the addition of velocities, which we will state for the sole purpose of stressing their complexity.

$$v'_x = (v_x - u) / (1 - v_x\,u /c^2)$$

$$v'_y = v_y / \gamma (1 - v_x\,u /c^2)$$

$$v'_z = v_z /\gamma (1 - v_x\,u /c^2)$$

We must remember that relative motion refers only along the x-axis in this case and that both **ß** and **γ** are the auxiliary constants mentioned previously.

- **Critical analysis of Lorentz transformations**

It is important to remember that until Einstein discovered the supposed true meaning of Lorentz equations, these were purely a mathematical game. Subsequently, Einstein's theories themselves went on to be a mathematical curiosity, until an eclipse started *the tinieblas time.*

Lorentz equations do not prove anything by themselves; they are mathematical formulae representing the error in the interpretation of the Michelson-Morley experiment by Modern Physics concerning light relative motion.

All they do is to alter the units of magnitude t artificially because reality cannot change with abstract reasoning.

Of course, when time unit changes, velocity changes, and so is momentum, angular velocity, energy, and other magnitudes. Consequently, the different units of the *International System of Units* change continuously.

One object or particle may have different times when compared to a ray of light, which moves in its line according to the direction of this ray.

Time, on occasions, depends on velocities that are neither real nor physical, but mental, such as the velocity of separation of two objects. Let us note here that, in *Global Physics,* the global aether is also supporting medium for kinetic mass –equivalent mass to kinetic energy.

Making an asymptotic transformation of variables produces a considerable loss of intuitive vision of the physical reality, and it overly stimulates speculative fantasy as it delves into imaginary solutions.

Another price to pay for Lorentz transformations is the impossibility to establish correlations when a particle reaches the speed of light, as asymptotic transformation at this point does not allow inverse ones because of the inherent indeterminacy or relativistic singularity. We are mainly referring to the proper time of light.

II.b.4. Poincare's postulates

Henri Poincare (1854-1912)
(Public domain image)

Michelson-Morley experiment showed no movement of expected fringes with the interference pattern, and therefore they suggested a new physical principle, the speed of light in free space is the same everywhere, independently of the movement of the source and the observer. The interpretation paved the way for the new theories of relativity.

Proof of this is that in 1904, Henri Poincare stated the following two postulates:

- The principle of Relativity – Physical laws are the same for all frames of reference. Preferred frames of reference do not exist.
- The principle of constancy of the speed of light – In a vacuum, the speed of light has the same value c for all frames of reference.

It is much like Einstein's relativity. Here are two little problems.

- *Racing photons*

  If the reference system is the Solar system, light on the surface of the Earth and Mars will take different speeds, not justified by the medium in which it moves.

  General Relativity has no solution, and therefore only provides local solutions.

- *Local Solution of General Relativity by gravity field*

  If the problem for a general solution is gravity field acting like a privileged reference frame, the solution could come making gravity field the luminiferous aether, as as proposed *Global Physics*.

II.c) Concept, postulates and elements of the Theory of Special Relativity

The *Theory of Special Relativity* put forward by Albert Einstein in 1905 discusses topics related to reference frames. Inertial reference frames are those moving at a constant velocity relating to others or the uniform relative motion.

This theory incorporated numerous ideas that were around during that time, and it discarded the existence of luminiferous ether definitively. It had various implications for the nature of light and the assumption of the relativity of time and space.

In the following section, we will briefly explain how –in addition to elements of the relativity of space and time– Einstein incorporated the novelty of the mass-energy equivalence; in other words, the concept of relativistic mass and and foundations of the atomic bomb.

The two postulates, which provide the basis for the *Theory of Special Relativity,* are the following:

- Physical laws may be expressed by equations that have the same form for all reference frames, which move at a constant velocity with respect to each other.
- The speed of light in free space takes the same value for all observers, independently of their state of movement.

One of the main criticisms is that *SR* is an *ad hoc* theory. *GR* subsequently had the same characteristic, as it developed to solve the insurmountable flaws of the first one, such as the paradox of the twins. Well, if GR solves this paradox is

because GR only gives local solutions, so one twin cannot go too far away.

- Tailored suit of mathematical interpretations

  No attempt to explain the nature of the speed of light entirely stuck. Then Einstein gathered a series of known facts from the era and fit them together in a more or less coherent ensemble. The process is somewhat correct; however, according to the scientific method, it weakens a theory's internal consistency.

  A fundamental piece was Lorentz equations and their peculiar interpretation of inertial systems of reference with the maximum of speed of light c. They resolved many problems, and they were indeed convenient; so, like a good tailor, a theory was made to measure.

  The first postulate of the *Theory of Special Relativity* refers fundamentally to "… *equations which have the same form*…", moreover, the second to "*The speed of light in free space takes the same value for all observers*…"

  The first postulate of relativity presents what Lorentz equations themselves implicate, which is that they do not change for different inertial frames of reference or observers. However, what it does change is internal variables definition, such as time, which goes from being monotonous, increasing, and exogenous function to an asymptotic and endogenous function.

  The second postulate of relativity is even weaker. It says what Lorentz equations do mathematically; speed of light is always the same for any reference frame or any inertial observer.

The last thing we needed would be that after doing the asymptotic transformation, it would be different from any frame of reference! Presumably, the scientific method does not like equations conventionally forcing a result, and subsequently, many people are saying multiple experiments confirm that value.

In fact, Einstein could have said, "*My theory is Poincare's postulates represented by Lorentz equations… besides, I know of the Michelson-Morley experiment.*"

The rest in Einstein's theory is the implications from the Lorentz mathematical game supported by the failure of the Michelson-Morley experiment concerning its original objective, and from the real physical existence of mass increase with velocity, relative to the natural frame of reference in an equivalent amount to which Lorentz equations imply. It happens that on the Earth, the natural reference system is Earth's gravity field.

The first support, known before the elaboration of *Special Relativity,* is on section *Michelson-Morley experiment.*

The second one, referring to relativistic mass, was very suspicious, as stress in section *Criticism of relativistic mass*, as there were physical experiments, which pointed in that direction. Nevertheless, the increase in physical mass is only real when we measure the movement within the natural or privileged reference frame, as we explain in section *Physics of movement with gravity* of the book *Physics and Global Dynamics.*

Furthermore, as is also mentioned in the said book, the fact that mass increases with kinetic energy is correct, but it also affects the spatial configuration of the mass as a whole.

> We will not go into technical details concerning whether mass increases –thereby literally fulfilling Newton's Second Law, and maintaining the principle of equality between inertial and gravitational mass– or whether the mass is invariant, but everything should be understood within a Lorentzian adaptation.

Let us see in the following section the elements previously mentioned, as well as some relevant terminological issues from *Special Relativity*.

II.c.1. Frame or system of reference

Any method or mechanism for measurement needs a frame of reference, a point of origin upon which to base the different measurements. It is the way of reasoning; it is the tautological principle that all movement is relative.

This topic comes up with the problem of *Classical Mechanics* about Galileo's *principle of relativity* from the 17th century. This stated that *any mechanical experiment would have the same characteristics in a system at rest as in one that moves at a constant velocity with respect to the first.*

Indeed, it is a matter of the classical concepts of force, mass, space, and time, with all the correspondent transformations when changing system or frame of reference.

The classical system worked perfectly until the appearance of electromagnetism and the nature of light, with its non-additive velocity regarding its source.

A spatial frame of reference has no secret; a point can be effortlessly determined within its frame of reference or changed using an adjustment of the origin of the new frame concerning the first one in each instant or moment with its relative motion.

$$x' = x - v\,t$$

$$y' = y$$

$$z' = z$$

Of course $t' = t$

We can easily obtain the correspondent magnitudes from one frame of reference to another using the Galileo transformations. Given two inertial frames of reference **F** and

F', t' = t

This equivalence of measurements is immediate and straightforward given the development of modern computers.

We may retain the same comment regarding the transformations under Einstein's *principle of relativity* and the aforementioned Lorentz equations.

- **Inertial and non-inertial frames of reference**

  When frames of reference move with a constant velocity with respect to each other, they are inertial frames. Logically, if this is not the case, they are non-inertial reference frames. All non-inertial reference frames accelerate concerning each other.

  In *Classical Mechanics,* magnitudes of force, mass, space, and time do not vary when they pass from one inertial reference frame to another; consequently, we call them Galileo invariants.

  In a non-inertial reference frame, inertia does not follow the classical principles implied by the second law of Newton or Fundamental Law of Dynamics, relative to the proportionality between force and acceleration represented by the mass of a body, and the Third law of Newton or *principle of action and reaction.*

  In a non-inertial reference frame, there will always be forces that support acceleration, and they will appear as fictitious forces –to which the principle of action and reaction do not apply.

  In relativistic mechanics, the mass changes with velocity in inertial reference frames. Moreover, it changes with a simple switch to a non-inertial reference frame. A constant

force does not produce a constant acceleration; this effect will be relevant when the speed becomes comparable to the speed of light, it is the effect of relativistic mass.

In the following section, we will see two conceptual errors regarding this matter.

- The independence of the observer

  Special Relativity is a theory pretending to simplify reality, as it states that we may express physical laws with equations that have the same form and that the speed of light in free space has the same value for all observers.

  In fact, these formal propositions take on an immense complexity, so big that reality –not only its description– ends up depending on each observer. The relativity of time and space takes on a variability that affects the units of force and energy.

  All measurements and units of the *International System of Units* (SI), also called the *International System of Measurements,* are dependent on the velocity and situation within the gravitational field of each observer. Moreover, it acts as if the mathematical apparatus used is real and not virtual.

  One must be careful with the concept of reality, because for now, we have never seen a *number* walking down the street.

  If we know all relations between the variables of the model, why we do not use this knowledge to create a stable system of units that would allow an intuitive vision of reality? *What interest is there in not allowing an understanding of anything?*

We have already commented on the definition of a second if we know how gravity affects atomic clocks, why the definition of a second does not include the velocity and the gravitational field intensity in the set of conditions for the clocks.

The *Theory of Relativity* besides being incorrect is the least scientific physics theory we could imagine representing reality.

◦ The theory of the ignorant observer

This example, together with that of the light balls, is one of my favorites.

The discussion is not serious because of *General Relativity* usually and especially, in this case, contradicts *Special Relativity* by establishing a preferred reference system. However, it will force the reader to concentrate and realize how easy it is to confuse with such inappropriate terminology. The experiment of the *Abrujuela on simultaneity* is similar and complementary.

Books about *Special Relativity* usually repeat this subject in various examples, but these have the same basic idea. Let us imagine a pair of inertial observers for t equals 0. One of them is in the center of a train wagon, which is moving at a speed that is neither fast nor slow. The other inertial observer aligns at the station with the first one.

Just at that moment, a pair of lightning bolts fall on both ends of the wagon –we know it because we are setting the example, if not it would be difficult to know it.

The inertial observer at the station –let us say that he is the manager of the station– is in an inertial system fixed to the

platform. This observer will see both bolts at the same time, because the distances from where they fell to him are equal, as he knows the speed of light is always the same –he had studied it just beforehand–, he deduces that the bolts are simultaneous.

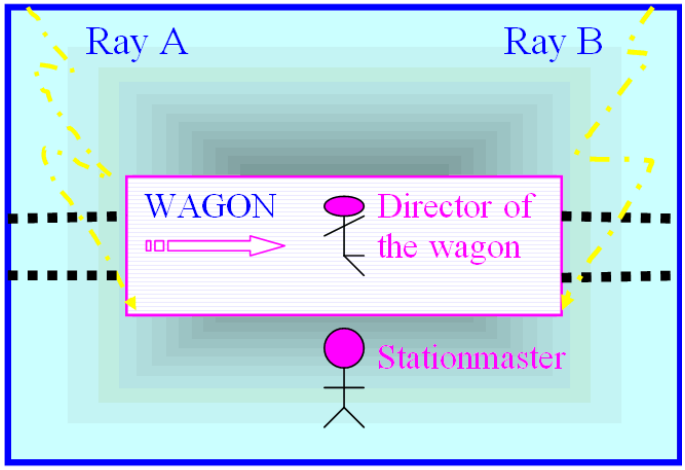
We are going to suppose that this inertial observer is intelligent –and we know he is the manager or something.

The inertial observer who is on the wagon, director of the wagon, is in an inertial frame fixed to the wagon. Because the wagon is moving, he perceives the bolt that fell with a jolt, sorry, we mean the bolt that fell on the front of the train first, since he is moving towards that point.

As he notices that both bolts fall with a small temporal gap –he had saucer eyes, like owls–, and because the speed of light is constant –he had also studied it–, he deduces that the lightning bolts did not fall simultaneously.

Science experiment

SMART BEAM



Source: physics books

The conclusion of Einstein's orthodox *Special Relativity:* two occurrences that are simultaneous for one observer are not for another inertial observer who is moving with regard to the first.

Our conclusion: following the scientific method and common sense, we can consider this observer ignorant. He

could have taken into account the time it took to receive the information of reality and his displacement during that time, to give him an idea; that would be the rational thing to do. Wouldn't it? *After having studied it and everything!*

Thunder and lightning! We do not want to imagine what he would have thought after hearing the matching thunder, for the time difference between them would be even higher, and it would probably cause him mental contradictions with the different simultaneities outlined.

Another thought situation could occur if two lightning bolts fell, but one of them fell on the ignorant observer. In this particular case, given that for this observer time stops indefinitely, he would think that all subsequent lightning bolts in the universe would be simultaneous. Then we could call him the enlightened observer.

The first observer was awesome, because he realized that the lightning bolts fell just on the little ends of the wagon, despite having seen one behind the wagon and the other some way in the front –he must've had eyes like an eagle–. There is a rumor that he was the little red dwarf from Venus.

As always, the clever neuron is lifting up its little dendrite to ask, *so what would have happened if we had switched the observers?*

II.c.1.a) Heliocentric model and Ptolemaic system

The ideas regarding the correct interpretation of reference frames are in section *Relativistic Physics* about *The non-distinction between physical or real velocity and relative, mental or abstract velocity.*

When discussing reference systems, a classical controversy comes to mind: between the geocentric theory or Ptolemaic system of the Greeks and the heliocentric model of Copernicus. It is essential to take into account that both are correct, as they are merely conventions. The difference is that the heliocentric model is far more straightforward mathematically and logically than the Ptolemaic system – naturally, as long as we are referring to the description of the movements of the planets in the Solar System.

The conventional correction of both heliocentric system and Ptolemy's geocentric model is a frequent example that any new theory must incorporate the previous one as a particular case. Nothing could be further from scientific reality; we hope it will be enough to mention the Earth being flat or round. Apparently, the current theory concerning the terrestrial globe does not include the previous one.

Just so there is no room for doubt, we completely accept the need for a frame of reference –however simple it may be– to define the movement. In other words, we share the principle that all movement is relative; we might even go so far as to say all thinking is relative.

A frame or system of reference can apply to any object, matter, or even a thought; but the reasoning behind this topic refers to a spatial frame of reference.

We believe spatial dimensions are no more than abstract concepts; by their nature or construction, they have a symbolic and absolute character to help the reasoning of the brain and with a conventional spatial origin. Even with the idea of a natural reference system, space is still a concept with a conventional spatial origin.

In this sense, space exists in mind without needing a physical reality. What's more, its physical reality –if indeed it exists– would not add anything to the concept.

At least, that is what we understood when they explained it to us when were little.

Despite movement being relative by pure tautology, we must figure out if there are natural reference systems more appropriate than others are. When we walk along the ground, natural reference system, or most common, or most useful, tells us we are moving and the ground is not. Of course, other points of view do exist, but they are not as powerful when explaining or attaining particular objectives. In other words, for these objectives, the best model seems to be a Ptolemaic system or geocentric model that makes the Earth-fixed.

A typical case of reference systems known to all of us is the heliocentric system applied to the solar system, as I mentioned previously. *Who goes in circles around whom on the dance floor?*

If we take the Earth as the origin of our reference frame, we find the Aristotle system, and subsequently the model of Greek astronomer Claudius Ptolemy, of 2nd century AD. In his treatise the *Almagest*, he put forth his hypothesis of consistent epicycles in circular orbits around the rest of the planets, on points that circled the Earth; it is the so-called Ptolemaic system or geocentric theory.

In the heliocentric model proposed by Nicolaus Copernicus

(1473-1543), the Sun is the center. The Greek philosopher Aristarchus of Samos proposes the same model by around the year 280 AD. *There are always some ahead of their time!*

- Heliocentric model versus Ptolemaic system

  Both models are correct, philosophically speaking, and equivalent concerning their efficacy when determining physical reality. The difference is that movement of the planets has simpler equations with the heliocentric model than with the Ptolemaic system –geocentric theory–. Consequently, science chooses the simpler of the two.

  In this case, the choice was easy, as it is not only about equations but about the most intuitive representation of reality, its concepts and the underlying laws of physics – which by the way, *seem to be able to be expressed in many ways!*

  Indeed, equations describing the physical reality of movement of planets in the Ptolemaic system or geocentric theory would require one or two additional variables to those used in the heliocentric model. These variables, from a mathematical point of view, could represent new dimensions and could come from adding variables, either converting existent constants into variables or making endogenous, exogenous variables.

  It is also possible that these complex equations were more general than those of the elemental system were. Undoubtedly, the latter would be a particular case of the general model.

  However, practically no one would think that Ptolemaic model is as valid as the heliocentric system. Certainly, no one would think that Einstein's *Special Relativity* follows a

sort of Ptolemaic system, not just at the level of planets, but of elemental particles. Moreover, with a couple of axiomones added to it: the constant speed of light, which is an absolute maximum, and its corresponding asymptotic transformations.

We also do not believe anyone would think that a change from the heliocentric model to the Ptolemaic system or vice versa would imply dilation of time or contraction of space. Despite that, this transformation would be more complicated than Lorentz transformations, as it involves relative circular motion instead of uniform rectilinear motion (MRU).

The necessary and sufficient condition to make relative time or space is to artificially alter the concept of speed, as these two are the only components of said concept.

◦ The Spinning Dancer

Let us change the subject and think about the *Ptolemy point model* in Einstein's *General Relativity*. In this model, the observer spins towards one side; then, after looking at the stars, he realizes that they have changed position at an incredible speed, so incredible that he will get a bit confused.

In other words, when the directional vector or "little arrow" applies to relative movements, some objects will attain a velocity so high that even the dilation of time could explode.

Surely, we would need a third postulate for this Ptolemy point model, which would go something like this: "*The formal equations for relative motion will not take into account directional vectors in their mathematical expression, and instead all*

objects will be considered point objects."

Another solution could be to apply some postulate or sub postulate in *General Relativity,* though right now we cannot think what it could be.

Besides, using a Ptolemy point model has another disadvantage because this system implies a denaturalization of the normal mechanism for abstraction of our brain, as it usually positions itself as an external observer to the object studied.

Moreover, this *Ptolemaic point model* uses a complex mathematical mechanism with variables that lack real significance.

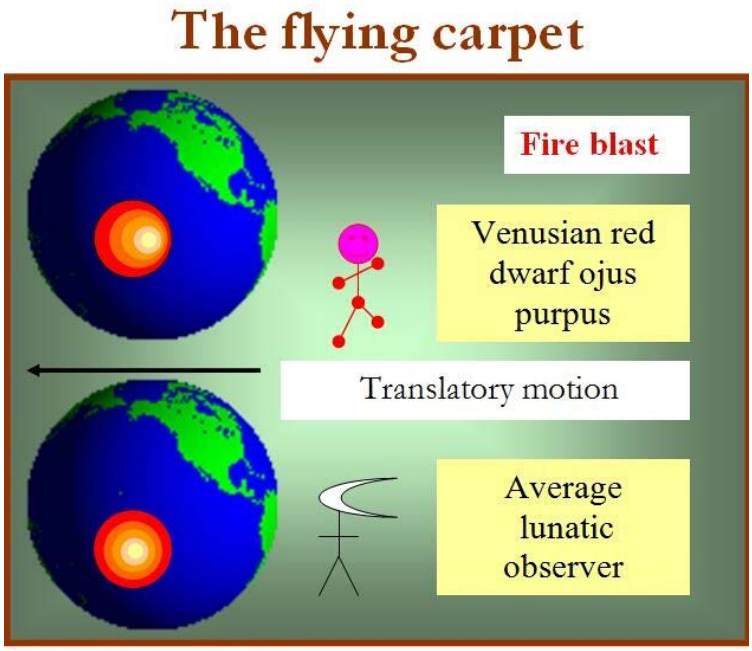
- Extra-terrestrial observers

A derivation of postulates of the *Theory of Special Relativity* is that speed of light is independent of its source and an observer. It seems to come directly from the results of the Michelson-Morley experiment.

It was Protona or Neutrona who told us this little story – which shows different results for Michelson-Morley experiment– to enlighten our neurons when it comes to this little topic:

"*Once upon a time, there was a little red dwarf with ojus purpus who lived on Venus (the lucky bastard); honestly, the way he was described to me, he must've been quite innocent.*

Reference system



Source: Protona and Neutrona

He liked Earth a lot because it was very blue and every so often, he saw fireworks; they were like huge multi-colored mushrooms or fungi.

He was an incorrigible peeper, but much he looked at the mushrooms –even out of the corner of his eye–, he could not quite understand why they always had an asymmetric shape. They were like balls that moved around as they grew. It was not logical, the colors changed tone inside it, but the shape did not depend on the colors, or if it was winter or summer on Venus. The asymmetric proportions seemed to be like small variations as if a lousus was moving around a bit.

As the little dwarf grew –in years, not in the height of course– he realized that the quickest part of this odd shape pointed to Earth's movement around the big hot yellow ball that he called the Sun.

After much consideration, he concluded that it had to be the heat, which was the cause of the marvelous shapes of Earth's fireworks. And then his head hurt so he went to bed."

The thing about heat and headaches and the whole story did not make any sense. Then, one of the two girls –the one who did not tell us the story– told us that it had to do with the other story about the *lost aether* and with looking at Venus from the Earth. In other words, the sight of the phenomenon of terrestrial balls, from an observer located outside the Earth's gravitation field, compared to a moonstruck observer (as the Moon accompanies said field poetically).

Therefore, after thinking and thinking, and then thinking some more… after various proto-sessions:

Whether the systems are inertial or non-inertial, if light moves at a speed **c** on earth and the Earth moves at a speed $\mathbf{V_E}$ with the Sun, it should not be too difficult to calculate the distance traveled in one second. Likewise, to know the total speed, which would be $\mathbf{(c + V_E)}$ **.** Anotherthing would be that we did not have the instruments necessary to measure this speed, but this is not

the case either.

At the same time, one could argue that its speed would be **$(c - V_E)$** when the movement of light is in the opposite direction. It would complicate things a bit, except that in our case it was explained in the story about the dwarf; which is to say, the shape of the fireworks in concentric circles from the Earth or off-centered from Venus.

The phenomenon of the figure and the figure of the phenomenon remind us of the enlightened *Doppler Effect*. It is important to note that this effect, in orthodox theory, should never occur. If it could happen, it would be because of energy effects, but not because of changes in the speed of light or in the speed of time.

The only satisfactory solution is that the aether or flying carpet is the Earth, but that sounds theological, and at this stage, it would not be funny. So let us improve upon this: the aether on Earth is Earth, on Mars, it is Mars, and yes, on Pluto it is Pluto.

Ultimately, if the aether is not fixed, what could it be? We believe that something analogous to the classical concept of aether is the global aether –reticular structure of matter supporting gravity and, indirectly, electromagnetic energy.

We say indirectly because global ether is the gravitational ether, but luminiferous ether is gravity field itself since it has to go with Earth in the Michelson Morley experiment. Light acts upon a gravitation field like a serpent upon the surface of the earth. On top of this, both move like a sinusoidal wave.

It would be funny if we did the Michelson-Morley experiment with a tortoise and, when it turned out the tortuous interference fringes did not change, we made it a

maximum.

This vision of nature is a physical vision, not a mathematical one. Evidently, the speed of a man walking on Mars is different from on the Earth or Pluto.

In the end, it is not by applying Ptolemy's geocentric model or the heliocentric system to physical phenomena. It is about whether or not a natural or privileged frame of reference does indeed exist, as all physical phenomena relate to movement.

In the books *Global Mechanics,* and *Physics and Global Dynamics,* we delve further into the new physics principles and mechanisms of gravity, mass, and kinetic energy.

II.c.1.b) Uniform rectilinear motion (URM) and relativity

The first criticism of Einstein's *Theory of Special Relativity* (SR) on the topic of uniform rectilinear motion (URM) is that we do not like the terminology of inertial and non-inertial reference frames for various reasons.

I am not comfortable with so many technical connotations of a concept; of course, this may be my own limitations. I will now present a few ideas I hope will explain why problems start with terminology of *inertial and non-inertial reference frames,* and why they worsen when you try to look at it more in-depth.

- Physical system and reference system

  A system of reference is an abstract concept that allows us to identify points in space from an arbitrary origin.

  A physical system is a set of things and energies. They should not be confused, because, in Relativity, one talks stereotypically about reference systems where all of them are at proper rest by definition, and they may contain elements that are at rest, have uniform motion or acceleration.

- The term "inertial"

  Neither Newton's *Classical Mechanics* nor *Modern Physics* explain the cause and mechanisms of inertia. The model proposed by *Global Physics* does so in the book *Physics and Global Dynamics.*

The term inertial makes us think of the inertia of objects to continue in their trajectory, whether it is physical, historical or from any other circumstance. Nevertheless, an accelerated system also implies inertia, even if it is not the only cause of its movement.

Maybe non-inertial systems should be supra-inertial systems!

Therefore, it seems that a concept used to limit the technical scope of *Special Relativity* is contrary to its ordinary meaning in Physics. What's more, sometimes it incorporates the notion of the *principle of equivalence* from *General Relativity*.

- One system or a relation between reference systems

  When one talks of inertial or non-inertial systems, one should be talking about the relation between the two systems because all systems considered individually are always at rest by the pure convention of *frames of reference*. Except if –going back to the previous part– we are talking in RG about a system in a space with gravity –or with geometric effects.

- Inertial reference systems

  In Classical Mechanics, when changing between inertial frames of reference –in uniform relative motion– there are the so-called Galileo invariants.

  In SR, this definition is the same, but the Lorentz transformations affect space, time, and the concept of relativistic mass and proper mass or mass at rest appear.

  In GR, due to the *Principle of Equivalence,* the concept of inertial reference frame changes and the mass is invariant.

- Inertial systems and accelerated systems

In any case, one talks about inertial and non-inertial systems but does not use the terms accelerated or non-accelerated systems, because there are systems that are not in motion, but considered as accelerated because of the *principle of equivalence* between gravity and acceleration from Einstein's *General Relativity*.

- Unsuccessful attempts of conceptual simplification

  When they mention that in inertial reference frames mass does not change with velocity, it may seem that inertial systems correspond to Newton's classical mechanics, and non-inertial systems to SR. Unfortunately, it has nothing to do with it. *SR* deals with inertial reference systems and GR with non-inertial ones, though the latter could have been inertial in the SR sense.

- Fictitious forces

  One has to admit that talking about the appearance of fictitious forces in non-inertial reference systems gives the topic a melodramatic touch. Some neurons even start to think about when the nightmare they are in will end, and what they have done to deserve this.

- Reference systems and observers

  Another reason why we do not like the terminology used is that observers are also inertial or non-inertial. It seems to be an improper personalization of scientific texts. To see the effect that all this kind of expressions has on our brain, we could ask ourselves how a non-inertial observer could see an immobile object in an inertial frame of reference. *Simple!*

  Continuing with the simplicity of the model, the concepts of inertial and non-inertial observers give the impression

> that the physical reality depends on them. *Ah, but that is what it is all about!* We always would have thought that it is about altering the point of view, or the measurement system, or our glasses, or whatever but that the physical reality, if it does indeed exist, is only one. *Alternatively, two at most!*
>
> *The theory of the ignorant observer* of section *Relativistic physics and mathematics* of this book also deals about this dependence.

That is, within the terminology of initial concepts, there are multiple ideas and some of them quite advanced. It is may be useful for specialists –although one would not think so– but, for those who try to understand relativity without dedicating fifty years of their lives to the task, it is quite a setback. Instead of science that simplifies the physical reality, it reminds us all the geographical abundance of a linguistic terminology.

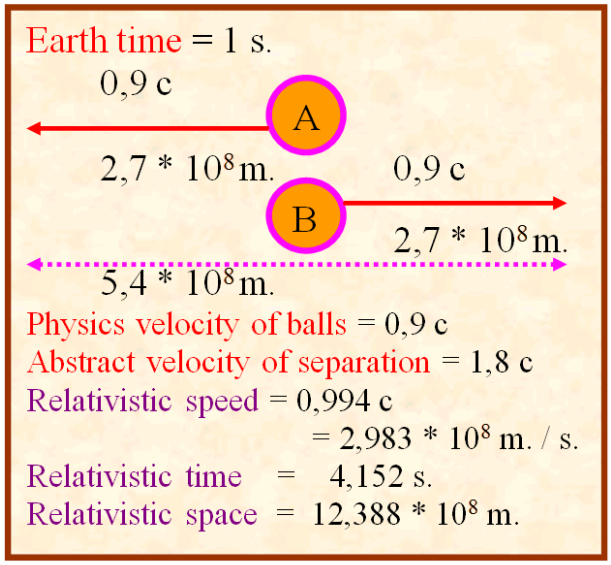
I am starting to understand why my father, when I was little, talking about things with other grown-ups, would sometimes use a Spanish expression which literally meant, "*One must not confuse speed with bacon*," meaning just that one must be careful not to mix up two utterly different concepts. He repeated this, not frequently, but often enough that one could tell he thought there was enough conceptual flexibility. *I cannot even imagine what he would have said if he had studied Modern Physics!*

- Non-distinction between physical or real velocity and relative, mental or abstract velocity

Let us see a simple example, which will enlighten us when it comes to the idea of maximum velocity in *Theory of Relativity*.

In order to make this more intuitive, we are going to suppose that the balls shown in the figure are small particles that shot out in uniform rectilinear motion in the opposite direction to each other and with a speed of 0.9 c.

BALLS OF LIGHT



Source: Plutona

When we measure their relative velocity, we will obtain 1.8 c, as after one second they will be at a distance of 5.4 * 10^8 meters due to their uniform linear motion. Because of the **axiom,** (anything except experimental proof) **dogma,** or whatever you want to call it, that **c** is the maximum velocity; this result cannot be correct. Consequently, when we apply the "*adequate and correct*" formulae we obtain the result that this velocity is 0.994 c, the time is 4.152 seconds instead of one, and that the space between them is 12.388 * 10^8 meters.

We could say it is something like the asymptotic-Pythagorean lowest common multiple!

This notion is one of the critical ideas against *Theory of Relativity,* which is why we use an unusually showy title for the figure below. A maximum limit is set, but not to the speed of light or physical speed, but to a speed that only exists in mind, as the speed of separation is a concept.

It is fair to say that there is a division of opinion in the physicists consulted concerning this existence of a speed of **2c** or close to it. It is almost as if relativity also affected technical opinions; it reminds us of the King's Indian defense of classic castling or survival by Darwinian adaptation.

Consequently, the need to make time relative is automatic, and everything that comes after. *By pure design of the model!* One applies the asymptotic transformation of relativistic velocity so that it can never be higher than **c.**

There must be compelling reasons behind why the scientific community has accepted this way of proceeding for a century.

It happens to all of us when it comes to coincidences; when two bizarre things coincide, we will assume that the only common factor we can find must be the one to explain it. In the case of *Theory of Relativity*, quite a few weirder things coincided, so it makes some sense they accepted it in its time.

Carrying on with the example, these assumptions of higher abstract velocities are entirely verifiable in an infinite number of cases. Suffice it to mention all the antipodal photons of all luminous stars and bulbs.

Therefore, the proposed dilation of time and shrinkage of space is completely artificial and imaginary.

We have another doubt; if maximum and constant speed of light is ***c***, where is the need to apply an asymptotic transformation to prevent it from changing? We are afraid that all cases in which there are *Lorentz transformations* they are in some way similar to this example.

Finally, one could cite the philosophical argument of when we make one ball the spatial reference origin; we cannot know if it is at physical rest or not, therefore, which ball is moving? Consequently, we apply the conventional formulae where **c** is the maximum velocity.

The reasoning does not add anything new. The ignorance of the balls when it comes to which one of them is in motion –whether it is in uniform rectilinear or geodesic motion–, does not negate the fact that reality exists, with specific physical laws that it must adhere to, and if possible, that they have minimal common sense.

The book *Global Mechanics* of *Global Physic* discusses the global aether or reticular structure of matter –supporting medium of the gravity field and, indirectly, of electromagnetic energy because the gravity field is the luminiferous aether– and the physical meaning of the mass-energy equivalence.

The implications of gravity on the concept of movement, force, and the reticular mechanism of kinetic energy appear in depth in the book *Physics and Global Dynamics.*

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II.c.2) Space-time relation and velocity

The concept of space-time continuum arises when the definition of velocity suffers a reversal. Velocity is no longer the relationship between space and time; a maximum appears conventionally. Therefore, space and time start to depend on each other so that the speed of light keeps constant. This interdependent concept configures the nature of space-time in the *Theory of Relativity*.

Nonetheless, let us go bit by bit.

- **Relativity of time**

  The law of relativity of time comes from the interpretation given to Michelson-Morley experiment. If one travels two different distances simultaneously and with the same speed, the only option not to get lost entirely is to make time relative.

  In the *Theory of Relativity*, the time $\mathbf{t_0}$ measured by an observer with a clock at rest for events that take place in the same spot is the proper time of the interval between events.

  A typical example found in books, meant to explain the concept of *space-time* and the so-called dilation of time, consists of an optical clock on a spacecraft and another on Earth. We will discuss it below.

  From the Earth, an observer would see that the ray of light from the optical clock goes in zigzag due to the movement of the spacecraft, while the clock on Earth would go directly from top to bottom.

Consequently, given the difference in the distance traveled by light and its constant speed, we must conclude that time changes for each observer. The dilation of time will be:

$$t = t_0 * (1 - v^2/c^2)^{-½}$$

Obviously, it is easy to generalize the thought experiment dealing with the structure of space-time to common clocks, and the dilation of time is, of course, super-proven *thoughtfully*. As a specific book says "…*this response is confirmed by detailed calculations regarding what happens to common clocks in motion, seen from the Earth*."

The concept of relativity of time has various implications. A prominent example is that *simultaneity* also ends up being relative, and even the principle of conservation of energy evolves to maintain its validity. The book *Experiments of Global Physics* proposes various scientific experiments about the measurement of time; in particular, the experiment *Train of the Abrujuela,* which deals with the problem of simultaneity.

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Regarding the question of time travel, dilation of time does not run back for any observer, though some quantum-relativistic scientists may try to achieve the contrary.

The *paradox of the twins* –optical clocks, normal ones or people– confuses the philosophy of *space-time* because of

the problem of which observer is to the right. The dilation of time effect of the observer on Earth respect to the clock on the spacecraft would be entirely symmetric to the effect on the observer on the spacecraft from the clock on Earth.

General Relativity gives an imaginary solution to the paradox of the twins. Relativistic mechanics tells us that accelerated reference systems are non-inertial, and one would have to take into account the various accelerations and decelerations of the spacecraft. Because of these successive accelerations, the spacecraft has been in different inertial reference systems.

In this book, there is a page dedicated to the *Paradox of the twins,* where we explain that it does not have a solution, nor can it have one in relativistic physics.

Another way of deducing the supposed relativistic nature of space-time –a little more complicated because one needs to master Pythagoras theorem– is using Lorentz equations. These were like a mathematical game until Albert Einstein discovered their true meaning.

Lorentz equations substitute Galileo transformations so that the two postulates of *Special Relativity* are valid: the expression of physical laws will not change, and the speed of light will be the same for all observers.

- **Relativity of Space**

The measurements of space may be relative any point, but a universal origin of space does not exist, or at least it is unknown.

Here the principle that all motion is relative appears again, but the relativistic relation of space and time does not refer to this fact, but rather to the contraction of space

according to whether we measure the speed in one reference system or another.

In other words, a meter does not always imply the same distance; it depends on the observer and his relative velocity. The only thing that remains constant with the philosophy of the curvature of space and time is the speed of light or space-time relation.

This concept of relativity comes from the *thought experiment* of the optical clock when the ray of light is moving in the direction of the spacecraft; as well as, of course, the orthodox interpretation of the *Michelson-Morley experiment*.

The hypothesis of contraction of objects in motion is the Fitzgerald-Lorentz contraction, and it is similar and complementary to that of time. It depends on the space-time axis that we consider affected in the relative motion between the frames of reference, the one for time, or the one for space.

If only the alteration of space is considered:

The relation of transformation still depends on **γ,** specifically, on its inverse. If it affects both axes, the mathematical formulae would simply become more complex, but the reasoning behind them would be similar.

$$L_0 = x'_2 - x'_1$$

$$L = L_0 / \gamma$$

The book *Global Dynamics* analyses in depth the motion of light in the new theory of everything. The *Global Physics* assumes a philosophy of absolute time and space.

Let us see a detailed explanation of the thought example-experiment of the optical clock in *Theory of Relativity*.

In this case, description of physical reality is, in our opinion, mistaken, because it implicitly incorporates inertia of light. The thought experiment caught our attention because a concept often discussed in this area is precisely that of inertial and non-inertial systems.

Another very intriguing aspect, and quite frightening, is that if the academy is using a thought experiment as an example, it must be because it does not have a more appropriate physical experiment. We would say that reality is not how it seems in the following thought experiment:

- Unreal or contradictory hypotheses

  "On a spaceship, a ray of light is shot out in a perpendicular direction to that of the ship. The ray hits a mirror and goes back to its initial point; an observer on the spacecraft will see both the outward and return journeys in a perpendicular direction to the movement of the ship. On the contrary, because the spacecraft is moving at great speed, an observer on Earth would see the movement of the light ray as a zigzag. In other words, the distance traveled will be greater for him than for the observer on the ship".

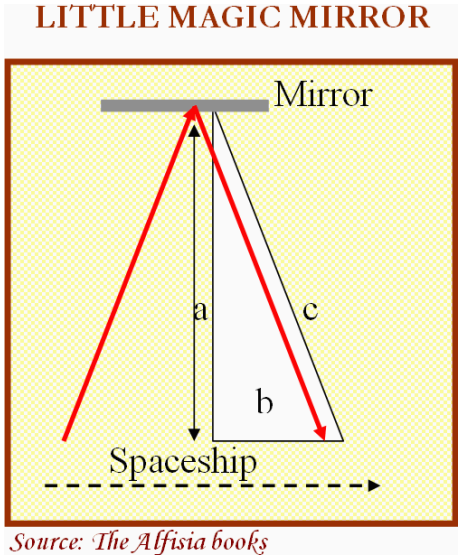
  We believe the speed of light is additive to that of Earth gravity field, but not to that of a train; in space, the same would occur concerning its gravity field –aether luminiferous–, but not to the speed of a spacecraft.

  The rest is easy. If one admits the constancy of the speed of light and assumes the inertia in its first trajectory and the return journey, the distance will be larger on the spacecraft than in the Earth. Then, the only possible solution is to make time relative and to invent relativistic space-time.

Here we come across a rectangular triangle again; time will have dilated enough that, with a constant velocity, the length corresponding to the initial distance (a) will be equal to the hypotenuse (c). In other words, the ratio of temporal dilation will be the inverse of the cosine of the angle formed between both these sides (c/a), which corresponds to the first auxiliary variable in the **Lorentz** equations. It means it will also be equal to the inverse of the square root of $(1 - b^2/c^2)^2$), which deduces from Pythagoras' theorem and coincides with the second auxiliary variable from the Lorentz transformations.

Honestly, one almost wants to ask *"Oh magic mirror, which is the nicer theory?"*

Thought experiment
(FLAWED)



Source: The Alfisia books

Moreover, we are afraid that if we had more observers or mirrors, we would obtain more triangles with a common side, and then we would have to make relative what is relative. Imagine the curvature of space-time that we could obtain with a pair of huge hexagons.

Other examples that we have seen in books on Relativity about crossing a river with a boat taking into account the movement of the water are similar.

II.c.2.a) Pythagoras' theorem and Einstein's Relativity

The *Theory of Special Relativity* is associated with great mathematical complexity, but we believe the complexity is conceptual rather than mathematical, as it derives from the application of *Pythagoras' theorem*.

- Complexity as an excuse

  One must not forget that we express concepts by means of words, and our brain has some meanings extremely ingrained, as they are very basic in a vital sense. Words like space and time are preconceptions recorded deep in our maind.

  Of course, at the same time, not only references to space are relative, but space itself is too.

  There is an explanation regarding the relativity of the perception of time by living beings, including twins; or the subjective relativity of time. Also, love appeared in the middle of it, We suppose that it was more convincing. *Who would dare deny that…?*

  Because this perception or subjective reality does indeed exist, they ended up accepting a scientific model, which states that if two objects are moving away from each other at the speed of light, the velocity at which they are separating will still be the speed of light, as in the experiment of the antipodal photons.

An additional element is that everything is relative; and when it is convenient because something does not quite fit, one can say *"Well, actually the matter is a lot more complex, but we were simplifying it implicitly, for… you."*

In any case, if required they just go back to *tensors* in the formulae of *General Relativity* and… *lights out*!

Why do they not explain that relativity of time means an asymptotic conversion of the speed of light so that it cannot exceed c and that it merely deduces from Pythagoras' theorem? Alternatively, even simpler, that the rate for the folding and unfolding of time is the inverse of the cosine of corresponding sides of the rectangular triangle.

◦ Discovery in Greece of Pythagoras' theorem

In case one consider relativistic physics complex, let us do an exercise and try to imagine how it must have been discovered in its time, and what Pythagoras' theorem involves of (assuming that they knew of the postal envelope and a bit of mechanics).

The trick entailed thinking of the envelope as open and closed simultaneously as if we were dealing with a quantum envelope. We look at the geometric curvature of the flap when it folds over inside the big square B (side=b), unfolds, expands or comes out and forms the small square A (side=a)

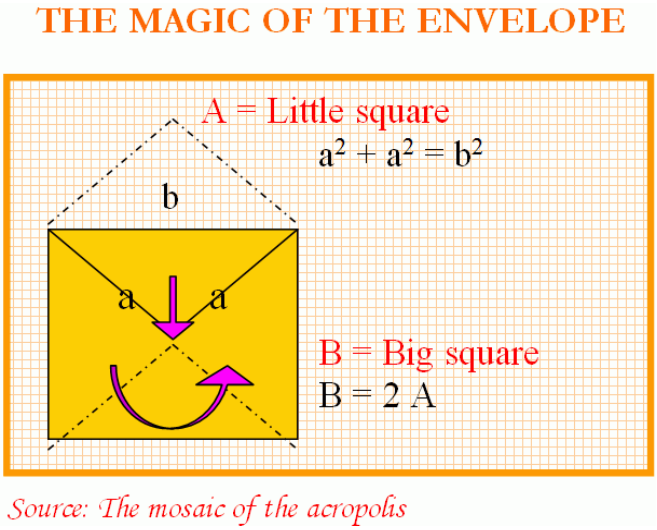
One can easily observe that the area of B is double the area of A. Then, as the area of B is b^2 and that of A is a^2, we find that [$b^2 = a^2 + a^2$], and when we take the square root of this, we obtain Pythagoras' Theorem.

Area of A = $a^2 = b^2 / 2$

When teaching children how to find the area of a square knowing its diagonal, they usually say one must calculate the length of the side using Pythagoras' theorem and then, square it, instead of saying that it is equal to the diagonal squared divided by two.

A concrete application of Pythagoras' Theorem to *Special Relativity* is in the figure of the thought experiment Unreal or contradictory hypotheses.

Pythagoras theorem



Source: The mosaic of the acropolis

This thought experiment shows the rectangular triangle that comes from different perspectives of two observers, plus the implicit idea that light conserves the inertia of the spacecraft, but only a hypothetical observer perceives that.

The figure is similar to the assumption above when talking about the element of the relativity of time; from where the temporal difference was:

$$t = t_0 /(1 - v^2/c^2)^{½}$$

- Discovery in America of Special Relativity

Effectively, a small calculation based on the modern Pythagoras' theorem, where the legs and the hypotenuse

are distances traveled by the light and by the object in relative motion, seen from different imaginary observers and conveniently mixed, gives us the result previously shown.

In order to help assimilate the above, we show the following equations, which allow getting an immediate idea of where this Pythagorean time is going. Also, bearing in mind the difficulty in its recognition, and because it has terrified the little neurons of half the world, it could be a phantasmagorical time.

The idea is to normalize the hypotenuse of the triangle as c or the speed of light. If the velocity u and c are identical – because they are those of light– while v is that of the spacecraft, we will find that the *dilation of time* must be proportional to the inverse of the cosine of the angle **α.**

Analytical deduction

Pythagoras' Theorem	$u^2 = c^2 - v^2$
Normalization c^2	$u^2 / c^2 = 1 - v^2/c^2$
Square root and we get Cos α =	$u / c = (1 - v^2/c^2)^{½}$
Find c	$c = u * (1 - v^2/c^2)^{-½}$
Substitute auxiliary Lorentz constant γ	$c = u * \gamma$

If light incorporates the inertia for an observer, we would have to conclude that he would think that we had the typical case of inertial systems with additive velocities, unless it was an observer of the zigzag but unaware of its meaning.

As we will see further on, he would not be far off from the vision of

reality that consciously is proposed!

Subsequently, the **Lorentz** transformations are perfect to ward off the ghost of **Pythagoras.** However, note the similarities of the two forms that the **cos a** takes with the two auxiliary constants of the equations.

One could say that *Pythagoras' theorem* is a particular application of the specific case of *Thales' theorem* when a straight angle exists.

It is also widely known that the fundamental theorem in trigonometry, sine squared plus cosine squared equal to one, is an elemental implication of Pythagoras' theorem. Both the quantifications of sine and cosine are by definition by considering the hypotenuse equal to unity. In other words, they would mean the number of hypotenuses in the adjacent leg or opposite leg to the angle in question.

At least traveling back in time is not possible. Thank goodness, because it would be a supreme act of boldness. What it is not explained very well is how –after a lapse of relative time– one goes back to regular time. *We suspect we might have to tug on the tensions of General Relativity!*

The cooktop that could appear with time games is an apotheosis. Ovens that are simultaneous for intelligent observers but that are asynchronous for the other observers, stretching distances, geometric effects stimulating the imagination, etc.

II.c.2.b) Spatial geometry

This section will attempt to emphasize upon the difficulty the brain has to reason when there is so much terminological variety involved. On occasions, rather than talking about errors or mathematical curiosities, one would have to talk about mental eccentricities. Let us first go over the concepts of space from the spatial geometry of physics:

1. **Euclidean geometry of space**
    - *Normal Euclidean space*

      Euclid's spatial geometry is a mathematical abstraction that configures a space with the three dimensions that we observe with our eyesight or sense of touch. Because of the abstract nature of Euclidean geometry, space is fixed and absolute. That is to say, if correctly defined, it would become unalterable, as abstract space is independent of its contents.

      In other words, in Euclidean space, when an object becomes bigger, space remains unchanged.

      The terms contraction and expansion of space are meaningless in Euclidean spatial geometry.

    - *Spatial localization and its perception*

      The localization of objects in the Euclidean geometry of space is independent of the mechanisms used in its determination. However, our own eyes, as well as any other instrument may make mistakes, and have a limiting level of precision.

We could mention here any mirror effect or similar to this, including the magnifying effect of light as it passes close to stars or gravitational lens effects. This difference between real localization and its information does not alter the abstract, absolute, and objective nature of space as a property assigned to physical objects.

- *Optical effect of the ordinary observer*

  This effect appears with distance; we all know that distant objects look smaller, at least in regular or Euclidean spatial geometry.

- *Optical effect due to the speed of light*

  Continuing with visual appearance, in 1959 there was an analysis of the presence that objects would have when they were in rapid movement, because of the effect of the small temporal difference in the perception of light coming from the part of the object closest or furthest from the observer.

  As it was discussed, the object appears longer than its actual size, as the rays of light that reach our eyes simultaneously correspond to two different moments. The ray of light coming from the part furthest from the observer is older than the closer other. Consequently, as the object is in motion, there will be a small difference between reality and its perception.

  The previous visions are produced in a *Euclidean spatial geometry* and must not be confused with those expressions that say that space curves, gets smaller, is contracted, etc., which are a consequence of Einstein's *Theory of Relativity* and which we will mention further on.

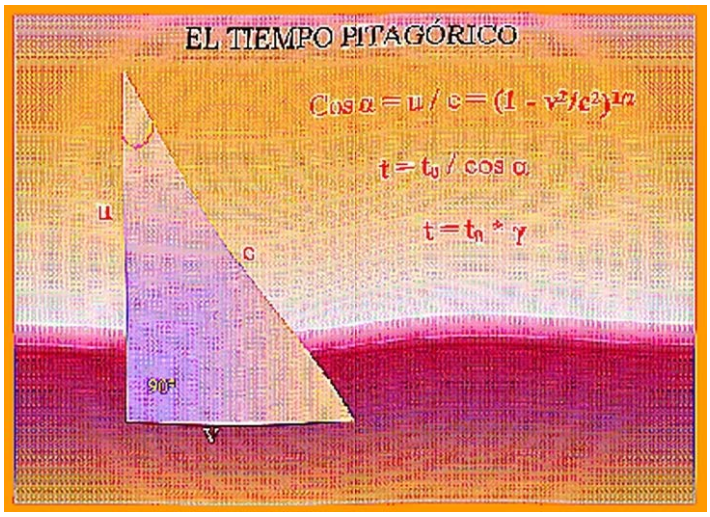
2. **Geometry of love**

The *geometry of subjective space, the geometry of love or life* is very variable, so variable that at times, just like time, we do not perceive it; the example of being asleep is sufficiently clear.

Another manifestation of subjective geometry would be the one mentioned when talking about the perception of the space-time of a bubble in the book *The Equation of Love*.

There are other geometries of love, which are non-mathematical or purely spatial, but it would be better not to talk about them in this section.

Geometry of color of love



3. **Relativistic spatial or space-time geometry**

- *The Lorentz-Fitzgerald contraction in the direction of movement*

The *Lorentz transformations* work with space in a similar way to the way I explained they do with time. One adds a fourth axis to the geometry of Euclidean space and the three typically spatial dimensions.

The consequence of the geometry of space of this relativistic variant is that one object will be of different sizes for different observers. It is not that they will appear to have different sizes (we all know that objects at a distance look smaller than closer). It is that their sizes are truly and simultaneously different. Of course,

one would also have to say what simultaneity is; like time, because it is relative, is also altered for one same temporal abstract moment.

I think it is more to do with a change in the measurement units of each observer; as the reality should be unique. *If indeed, it exists, of course!*

- *Einstein's Special Relativity*

  This concept is identical to the previous one, except that it does not say whether things are bigger or smaller. It simply states that it is space that contracts or expands, according to the observers. It is the **Hermann Minkowski** space-time.

  Indeed, the relativity of space does not add anything new to the consistency or inconsistency of the dilation of time in the *Theory of Special Relativity,* except that it seems that a **meter** is a lot shorter than what it is for a **meson.** This particle travels 600 meters before disintegrating, but from the surface of the Earth, a relativist observer would swear it was 9500 meters.

  Something quite fun about the relativistic *spatial geometry* is that, despite the speed of light being constant, the objective space traveled in a second is not always the same. As a second is relative, and the meter is distant covered by the light in one second, by relativistic definition, the light will go almost 300 million meters in one second; when the second is shorter, the meters will be smaller too.

- *Geometry of space in General Relativity*

  Let us fast-forward a bit; if Einstein's *Theory of Special Relativity* dilates and contracts space, when one adds the

axis of time to the three spatial Euclidean dimensions, the *General Theory of Relativity* –also **Einstein's–** will curve these axes according to gravity. We could mention the developments or comments by **Stephen Hawkins** and **Roger Penrose** from the 70s onwards. Likewise, the so-called **Riemann** geometry and **Schwarzschild** metrics may produce tensions in many dimensions.

This spatial geometry is difficult to explain because when they say space does not dilate but is the distance between two points in space that becomes larger, we end up losing myself entirely due to the lack of vocabulary for so many space-conceptual relativities.

We have attempted to understand what it could mean that space or its geometry dilates. Maybe it is referring to –amongst other things– the fact that if light, as it travels on the gravitational field, curves independently of the gravitational attraction; then one could think that it is space that has changed. We would not consider it the most appropriate interpretation, but at least it would make some sense.

It would be more precise to say that when light travels on the gravity field –tension of the radial symmetry of the reticular structure of matter–, the energy exchange produces a curvature effect on the propagation of light concerning the Euclidean space. The book *Physics and Global Dynamics* explains the cause of the *Merlin effect,* which is no more than a small gravitational force in addition to Newton's force.

A different topic is that of drag; let us imagine a Vinyl disc spinning on a turntable. If we place an object upon this disc, the object will turn –but not because of the

effect of gravity, but because it is being dragged by the disc. Although traditional gravitational forces cannot explain it, and although it could be correct to a certain extent, we would not call this a geometric effect of the curvature of space-time-disc. We would just call it the drag of the *Vinyl-Disc* experiment.

A different topic is that of drag; let us imagine a music disc spinning on a turntable. If we place an object upon this disc, the object will rotate –but not because of the effect of gravity, but because it is being dragged by the disc. Although traditional gravitational forces cannot explain it, and although it could be correct to a certain extent, I would not call this a geometric effect of the curvature of space-time-disc. I would simply call it the drag of the *Vinyl-Disc* experiment.

4. **Geometry of quantum space**

There is a tendency in *Quantum Mechanics* to deny the existence of space, as we understand it. The idea is to reduce the *geometry of space* to a set of discrete points and turn it into an *analytical geometry in three dimensions* –or however many are necessary to represent the experimental observations with the particular mathematical model in use.

It is a substantial problem, probably of a sociological nature, to confuse mathematical dimensions with physical ones. For some people, any mathematical variable could be an additional spatial dimension. I would say that one should be evident to the fact that spatial dimensions are very different to many other variables, even if a computer does not quite differentiate between one and another.

5. **Spatial geometry in String Theory**

> With this geometry of space, we could spend our time playing hide-and-seek, because with so many dimensions it cannot be easy to find adequate concepts to describe the physical reality. It seems that it deals with an intensive use of mathematics.

Of the five points we have mentioned about ways of understanding the geometry of space, we believe the first two coexist, while the last three are more or less recognized theories, but that cannot contribute direct experiments, due to the very abstract nature of space and obvious physical reality.

We will now attempt to explain the physical meaning behind some geometries of space, not necessarily in an academic fashion.

- Flat geometry of Euclidean space

  Let us do magic; let us try to define tridimensional Euclidean space using an element of two-dimensional flat geometry solely.

  Recalling **Plato** the Greek, we could make the following definition of the geometry of space in three dimensions: "*It will be the three-dimensional space, which will project shadows upon a two-dimensional plane, by the so-called laws of the sunshade.*"

  Another example would be the projections of three-dimensional harmonic waves upon a plane or element of plane geometry. Do not be scared; a good enough approximation would be to imagine the shadows of two balls bouncing on a sunny day.

  The same would happen for an analytical geometry of three dimensions or Euclidean geometry. Of course, it has a trick answer, just like all good magic: the third dimension is not included in the two-dimensional Euclidean space of reference, but in the equations that would express the laws of the sunshade, which indeed transform it into an analytical geometry of three dimensions.

  It is interesting to note that the equations of the aforementioned little laws would contain information about a world much more complicated than the two-dimensional world of reference. Because of this, they would have a much more general application than those

laws, which describe a *two-dimensional Euclidean space* or flat geometry.

In other words, one cannot define a Euclidean space or plane that folds over or allows other magic tricks, because it would be playing with the language.

A third dimension can be "*folded*" and integrated or superimposed on a flat geometry, but the two dimensions of the plane will remain unaltered, or at least with the same rules they had unless we change them too. In this case, we would be breaking the plane, the train, the concept, and everything.

It would be too much like the *theorem of the fat point,* by which two parallel lines pass through.

We should highlight that including a new type of relation which affects the reference coordinates or axes of the plane is equivalent to adding new dimensions, where these would be the laws which govern their change or variation. It is a fundamental concept of geometry and mathematics.

In fact, this is what I think the **Lorentz** transformations do with their equations.

It may have been convenient to search for equations with more variables, which would facilitate specific calculations and some comparisons, in the same way, that *Relativity* undoubtedly does. However, these must not make one lose the notion of fundamental physical concepts for the logic of our nature, such as objective time and space.

II.c.3. Concept of mass, inertial mass and energy

Global Physics explains the concept of the global ether – reticular structure of matter supporting potential gravitational energy, kinetic energy, and mass– in the book *Global Mechanics.*

Likewise, the book *Physics and Global Dynamics includes a* definition of energy as a property of global aether.

On this page, we will comment and criticize the definition of inertial mass of *Classical Mechanics,* the definition of relativistic mass and other related concepts.

- **Definition of inertial mass**

  According to classical mechanics, the *second law of Newton* states that if a force acts upon a body, it will acquire acceleration directly proportional to the force applied, where the constant of proportionality will be its inertial mass. Consequently, a constant force could raise the velocity of an object indefinitely.

  This aspect contradicts the impossibility of exceeding the speed of light in relativistic mechanics.

  However, relativistic physics maintains Isaac Newton's *principle of equality between inertial mass and gravitational mass.*

  The conservation of this principle is slightly artificial, as the precession of the orbit of Mercury, th rest of the planets, and stars show the opposite unless space would stretch to attain the quadrature of the orbital circle.

  The Merlin effect in the book *Physics and Global Dynamics* explains the small deviation between gravitational mass

and inertial mass.

Furthermore, the new perspective of the definition of mass, which provides the book Global Mechanics, makes both concepts of gravitational mass and inertial mass unnecessary and imprecise; because the new concept focuses on what is mass made of instead of how it behaves. Nevertheless, both concepts are complementary for a better understanding of reality.

- **Definition of relativistic mass**

The most notorious consequence of the postulates of Albert Einstein's Special Relativity was the equivalence or conversion between mass and energy.

Relativistic physics deduces this equivalence when applying the formulae of kinetic energy with the *principle of conservation of momentum* to those associated with changes in relativistic velocity. Specifically, the resulting equivalence is:

$$\mathbf{m = m_0 /(1 - v^2/c^2)^{1/2}}$$
$$\mathbf{m = \gamma\, m_0}$$

Where **m** is the mass –or relativistic mass– of the body, $\mathbf{m_0}$ is the mass at rest or proper mass and **v** the velocity.

The mass of a body is greater when it is in relative motion regarding an observer than when it is at rest.

Moreover, with the series expansion of the constant **γ,** it is easy to deduce the relativistic kinetic energy:

$$\mathbf{E_c = \tfrac{1}{2}\, m_0\, v^2 = (m - m_0)\, c^2}$$

Therefore, the total energy:

$$\mathbf{E = mc^2}$$

The first experiment, which confirmed relativistic mass, was the discovery of **Bücherer** in 1908 that the relation between the charge of an electron and its mass (e / m) was less for fast electrons than for slow ones. Subsequently, an uncountable number of experiments have confirmed the above results and physical formulae.

Energy and mass, therefore, turn into two manifestations of the same thing. The principles of conservation of mass and energy in classical mechanics become the more general relativistic principle of mass-energy conservation.

- **Mass is invariant**

  Despite what we have just said, in Relativity the mass is invariant. In fact, its definition in the International System of Unit is of an absolute nature.

  The trick is to measure always the mass at rest, and if the object moves within a system, to integrate it into the physical system, calculating the mass of the whole system at rest.

  One could also define the second with the Cesium atom at rest and a particular gravity –then all of the Relativity would be formally incorrect.

  If the mass cannot be measured in motion, I wonder where the concept of inertial mass lies or how the equivalent mass to kinetic energy is found.

Up until this point, it has been more or less an orthodox presentation of relativistic mass. It seems more logical to us to make the deductions in the opposite order: start with the mass-energy equivalence experimentally confirmed, and deduce the maximum speed of light instead of postulating it as a mathematical axiom. Afterwards, there should have been a

search for a physical explanation of these phenomena, instead of subordinating the physical theory to the mathematics. For example, there is the mathematical axiom of the maximum and constant speed of light and *Global Physics* maintains that it is neither maximum nor constant.

However, it is fair to recognize that some quantitative explanations of relativity are very impressive, such as the precession of the perihelion of Mercury– although in 1898 Paul Gerber explained this precession before the relativistic physics with the same exact formula. Nevertheless, *The Global Physics* also explains it using the same formula under an alternative paradigm of physical reality.

Some of the *misleading coincidences,* the *cousin's paradoxes,* and the points described in section *Relativistic physics and mathematics* relate to the definition of relativistic mass.

- **Quantitative predictions and their measurements in the physical experiments**

  When making predictions, conceptual mistakes appear, and they appear again when interpreting the results of numerous physics experiments. In this case, the elemental bases of the scientific method would breach.

  Every device that uses modern technology could be a device of *Lucifer*; usually, it will contain metal in its mechanism, and it will use electricity.

  Moreover, the precision of measuring devices in this topic is extremely conditioned by the nature of the physics experiments, as if the very mass and energy of these devices could be affected, and it could get confused with changes in space and time.

  It occurs with clocks –especially if they are atomic clocks–

on spaceships; speed and gravity disturb their mechanisms, due to the effects of the resonance of mass, and they end up losing the synchronization that they previously had, but it does not have anything to do with the relativity of time.

Another example, the speed of light is maximum because of the application of the **Lorentz** formulae, not because it verifies when measured. Otherwise, it would not be necessary to do this transformation.

Nonetheless, there are not always mistakes; Astronomy is continuously providing new and contradictory data.

A different problem is the existence of so many facts derived from the application of current laws. The mass of the planets and distances between them are prominent examples of these cases. It is also fair to say that the calculations they take into account possible interrelations between the data.

Let us see an example of how the measurements of many properties are not as perfect as one would think. We do not mean to say that they should be better; on the contrary, we merely wish to state that the real limitations were more significant than what the public thinks.

As we know, gravity on Earth is:

g = G mass / space²

Where according to reliable sources:
g = 9,80665
G = $6{,}67266 * 10^{-11}$
Mass = $5{,}97370 * 10^{24}$
Radius of the Earth = $6{,}378140 * 10^{6}$

Perhaps one of the most influential causes of certain confusions is that popular science

programs always try to show the most advanced and impressive parts of science while minimizing the small setbacks, though sometimes they can be insurmountable.

Now, both the mass and the radius of the Earth are values obtained indirectly. One also has to take into account the difficulty in determining the radius with exactitude down to the millimeter, as there is no line drawn to the surface of the globe.

In fact, gravity changes from the Equator to the Poles, because the Earth is somewhat squashed. It also varies due to the effect of the centrifugal force, as is shown by the experiments *Vinyl-Disc*, *Petrus Wave,* and *Spinning Top*. Moreover, it is very probable Earth is squashed because of the effect of the centrifugal force in the long term.

The same happens with the mass; we do not have scales large enough to weigh the Earth as we do with little balls. We would even have to take into account the variations in its kinetic energy. Of course, it would be nice to know the preferred reference frame of kinetic energy. *Global Physics* states it is the global aether.

Besides, there are different types of mass. For example, mass that corresponds to kinetic energy has different characteristics to mass at rest, as its spatial configuration is different.

The conclusion we want to reach is that the *Theory of Relativity* is not necessary to deduce that mass increases with velocity and that the mathematical relationship is the inverse of the sine. This connection is typical in theoretical physics for cases in which magnitudes depend twice on the same variable. Paradoxically, saying that velocity increases with kinetic energy could be correct from a cause-effect point of view.

At the beginning of the 20th century, the maximum velocity known was that of light, and the mass of electrons increased with their speed. If observations tell us the relation is not linear, but exponential, I do not believe it would have been tough for someone to be able to find the following existent mathematical ties between mass at rest and total mass [2a] and [2b]. In fact, this would have been more probable if these relations were only observable at velocities close to the speed of light.

From the conceptual and mathematical meaning of the equations **[1] [2b]** and **[3],** one reaches the famous equation **[0]** without using relativity at all. In fact, it seems that it was **Olinto de Pretto,** an industrialist, and mathematician from Venice, who first published the formula $\mathbf{E=mc^2}$ in a scientific magazine called Atte in **1903.**

In other words, mass or some types of mass increase with velocity, or the other way around; but no relativistic hypothesis is necessary, it is a physical phenomenon like the changes in the state of water from solid to liquid to gas.

- **Proper mass and relativistic kinetic energy**

  The mass-energy transformation or equivalence:

  $$\mathbf{[0] \quad E = m\,c^2}$$

  This famous formula –originally from Olinto de Pretto– is the most striking contribution of the *Theory of Relativity* because it is the theoretical basis for the atomic bomb.

  By definition of *General Physics,* we have that:

  $$E = \text{force} * \text{distance} = N * m$$
  $$E = \text{mass} * \text{acceleration} * \text{distance} = kg * m^2 / s^2$$
  $$\mathbf{[1] \quad E = mass * velocity^2}$$

Which makes Einstein's equation somewhat less spectacular **[0]**

We know that Einstein said he came to this equation because of his *Theory of Relativity* and that as a previous step deduced the formula for relativistic mass:

$$\mathbf{[2a]} \quad \mathbf{m = m_0 /(1 - v^2/c^2)^{1/2}}$$
$$\gamma = 1 /(1 - v^2/c^2)^{1/2} \approx 1 + \tfrac{1}{2}\, v^2/c^2$$

Where **m** is the mass or relativistic mass of the body, $\mathbf{m_0}$ is the mass at rest, or proper mass and **v** is the velocity.

It may seem like a very complex formulate, in fact, it is effortless. Relativistic mass is a function of the product of the mass at rest and the inverse of the sine of the angle formed by the velocity and the speed of light if they were a leg and the hypotenuse of a rectangle triangle, respectively.

Now we can say that the formula for relativistic mass **[2a]** is also less spectacular than it seems. Moreover, it simplifies after using the **Taylor** series expansion of the constant **γ** that would give the following approximation:

$$\text{kinetic mass} = m - m_0$$
$$\text{kinetic mass} \approx m_0 (1 + \tfrac{1}{2}\, v^2/c^2) - m_0$$
$$\mathbf{[2b] \quad kinetic\ mass \approx m_0 \tfrac{1}{2}\, v^2/c^2}$$

From a different perspective, mass obtains speed when a force applies to it. The additional energy of the mass is kinetic energy, and *General Physics* quantifies it. Therefore, we have that when kinetic energy increases mass increases, and it seems evident that the inverse process also exists.

$$\mathbf{[3] \quad E_k = \tfrac{1}{2}\, m_0 v^2}$$

- **Reference systems of space-time and relativistic mass**

On the other hand, I would say relativistic physics maintains that mass depends on each observer or reference system. It still seems quite strange; either mass is not something physical after all, or the only thing that changes with the reference frame is the collection of units in the International System of Units (SI). However, the unit of mass or kilogram has not changed yet.

Focusing on the corollaries or deductions from the postulates of the Theory of Special Relativity, we can see the errors that he makes and try to understand or figure out the right laws of physics, with abstraction or distance from all the mathematics.

Depending on which observer is the origin of the reference frame in space, bodies will have different masses not only for their same physical velocity but also for their same time. Sorry, not the same time, because of the relativistic definition of time, time also depends on the reference frame and consequently, the principle of simultaneity has lost its autonomous meaning. *With this entire making relative the language, we cannot go anywhere!*

If we take as a system of reference one that is not the natural or the simplest one, then our brain will have more problems when it comes to interpreting the physical reality, according to how much the new reference frame departs from the first. An example case would be to think that the whole Earth accelerates down towards a pear situated somewhat underneath it. I am sure Newton would say, *"This is pear-fect!"*

It is a problem with so much relativity, there are some relative things and others, which are not. Philosophically speaking, one can always argue against this, but we could also say that physical reality does not exist. However, I do

> not think we would still be in the scientific realm if we did. At most, we could be practicing the Goose Game with knives instead of dice. Reality exists, and one has to try to understand it and explain it in the simplest way possible!

In *Global Physics,* mass depends on velocity, but the increase in kinetic mass is due to the speed measured concerning its natural reference system. The global aether or the reticular structure of matter that also supports gravity and mass.

Let us note that natural system of reference of electromagnetic energy is not the global aether, but luminiferous aether or gravitational field. However, we are entering into slightly speculative topics; if it were the case, the gravitational constant G would be affected by using different reference systems that implied a different proportion between proper mass and kinetic mass. It would be due to the double gravitational force, which operates on kinetic energy –in the same way as it does on electromagnetic energy.

One would have to be especially careful with the interpretation of experiments such as that of the gyroscopes on the NASA spacecraft Gravity Probe-B.

The definition of movement and its particular characteristics are in the book *Physics and Global Dynamics.*

The book *Global Mechanics* presents a new proposition about the creation of mass; it implies not only a *Great Unification Theory* to explain the electroweak and the strong nuclear interactions, but also a *Theory of Everything* (TOE), as it also unifies these interactions with the gravitational one.

In other words, and simplifying the physical model of the new theory of everything a bit, the global mass depends on the mass at rest and on the kinetic mass that modulates it, and it

produces the reticular mechanism of kinetic energy.

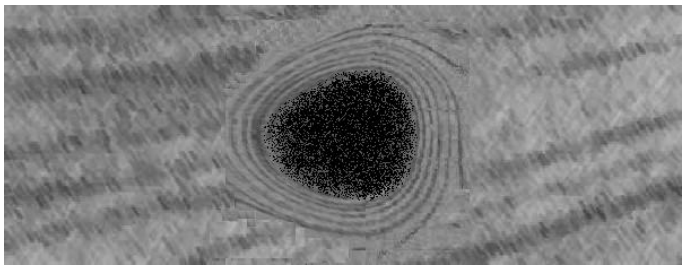
In order to start facilitating the task of identifying the different concepts of physical realities, and even the different perspectives of one single thing, I have been mentioning some terms used in the books of *Global Physics*.

We will call global mass the concept of total mass in motion. Global mass will be a mass at rest plus the increase in this mass due to the increase in velocity. The increase in mass will be kinetic mass, and it is equal to kinetic energy divided by $\mathbf{c^2}$.

We have chosen the term *kinetic mass* to avoid terminological confusions with relativistic mass and inertial mass, as both of these words are used on some occasions as total mass and others as kinetic mass.

Global aether and mass

Reticular mechanics of kinetic energy



Meanwhile, the concept of mass at rest is confusing; it is not a suitable designation, because of the multiple frames of reference used in relativistic physics. Consequently, we will stay with the concept of proper mass, defined as at real rest on its natural frame of reference.

global mass = proper mass + kinetic mass

These concepts of mass are very important, as their origin, destination, and physical relations are different in *Global Physics*.

The equation **[2a]** is now the *equation of global mass*. Now, the coincidence of the relation between the mass increment with

velocity and the equation deduced by Einstein from his relativistic mechanics is clear.

I believe this coincidence has confused the scientific community.

In other words, if every time a physical phenomenon appeared following a transformation due to derived forms of Pythagoras' Theorem; or relations between variables following the proportion of sine, cosine or their inverses, one decided to make relative time, right now we would not be able to know what year we were in.

However, this is not what has happened historically; on this occasion, there were more coincidences, and they did not find the philosopher's stone, as I have already mentioned in other sections.

II.c.4. Theory of light

This section studies the theory of light from its essential physical nature. In other words, the characteristics derived from what is light as electromagnetic energy and its behavior or fundamental relations with other concepts of *Modern Physics*, such as kinetic energy, mass, and gravity.

A curiosity of relativistic physics is the non-understanding of the nature of light, as it does not explain why the speed of light is a maximum; it merely imposes it as a mathematical axiom. What is worse, there is an evident confusion about this maximum because one can read many times that it has been experimentally confirmed.

When *Theory of Relativity* came out, it could have made sense given the little experience that they had in that era; but after a century of scientific development, it seems strange that *Modern Physics* still does not explain what light is and what the origin of the speed limit is. The wave-particle duality of light is nothing more than a way of recognizing that the concept of light, some of its characteristics and its nature are still unknown.

No doubt, *Modern Physics* is in a state of change. The search for a unification theory or a theory of everything, which explains what light is and it manages to make *Quantum Mechanics* compatible with Einstein's theory or substitutes both theories, is a topic evermore present in the scientific environment and the media.

The lack of a concept of light is obvious within *Modern Physics*. On the one hand, the *Theory of Relativity* is an abstract and mathematical theory, and on the other, *Quantum Mechanics* has

renounced to explain the reason for *Heisenberg's Uncertainty or Indeterminacy Principle*, significantly conditioned by the aspects supposedly proved by Einstein's theories.

In *Modern Physics,* one can talk of dark something, quantum something, or double nature of something meaning its nature is unknown.

The following points deal with the characteristics of light from *Relativity, Quantum Mechanics,* and *Global Physics.*

The first point relates to what light is from the perspective of its material reality, the relation of light with mass and its main characteristic of being energy.

Although it is difficult to separate some properties of light from others, the second point deals with the nature and characteristics of light regarding velocity.

The books *Global Mechanics* and *Physics and Global Dynamics* contain an explanation in depth of these two points within the new paradigm of *Global Physics.*

II.c.4.a) What is light?

In order to understand the concept of light, let us analyze the following elements and essential relations separately:

- **Material support of electromagnetic energy**

  The *wave-particle duality of light* is one of the least understood characteristics. On the one hand, its wave nature is indubitable given interference phenomena. On the other, the behavior of light as a particle, as deduced from the photoelectric effect, is intriguing because I do not see anything unusual or any particle in a vibration on a table that makes a ball jump over a small barrier.

  The unknown variable is still the eternal question of what light is, and whether or not it has mass. According to relativistic physics and *Quantum Mechanics,* a photon of light is a massless particle – it must be a different way of saying a wave. Of course, another problem, *Modern Physics* does not know what mass is, and so on. The concept of light as an abstract and generic particle seems to be more philosophical than scientific.

  An adequate definition of light of *Modern Physics* is a mathematical or abstract force field that automatically reproduces in free space. Afterwards, there are all types of singularities, uncertainties, and versions, from time travel to effects of other dimensions.

  The lack of a clear concept of light and mass is worsened with Einstein's famous equation –originally from Olinto de Pretto– of the transformation of mass to energy and vice

versa **E = m c².** The brain ends up believing it, and it seems that they are always interchangeable.

Hat galaxy in infrared - NASA

(Public domain image)

However, for *Global Physics*, the concepts of light and mass are very different, despite having a common characteristic, to be manifestations of the elastic energy of the reticular structure of matter or global aether.

In other words, the meaning of Einstein's equation of transformation between mass and energy is the transformation from one type of energy to another. Quite the contrary, other characteristics of light not included in the equation above are different to those of mass, as light and mass are two different concepts in *Global Physics*.

Gravitation in relativistic physics does not detect that, in the process of transformation from one type of energy to another, other alterations occur. In other words, the reticular structure of matter transforms and changes its energy properties.

The new theory is intelligible with the usual meanings of the words energy and mass. On the one hand, from the concept of light that we all have, we deduce that it is a property of matter in general; that is to say, energy is a property of something physical. The definition of light or energy on Wikipedia goes the same way, although it gets

messy when using the word system.

On the other hand, the meaning of mass relates directly to an element of physical or material reality.

Moreover, the concept of energy itself involves mass, acceleration (time) and the distance traveled as independent magnitudes or units in its definition. In other words, the magnitude **m** refers to something physical, and time and space contained in acceleration and distance magnitudes are properties of the physical reality.

- **Light in phenomena of creation of mass and wavine**

Mass, for the *Standard Model* of *Quantum Mechanics,* is a mystery; and, even now with the **Higgs** particle that is supposed to bring the mass to particles with mass, the mystery continues.

In *Global Mechanics,* mass is reticular matter compressed due to the electromagnetic energy or transversal torsion energy on the global aether. In this way, the torsion energy transforms into reversible compression energy and tension of the longitudinal curvature or gravitational potential energy.

Wavine is a type of unstable mass, which corresponds to electrons. In order to travel from one orbit to another, electrons become electromagnetic energy, until the reticular structure of matter compresses again, relaxing the differences of transversal tension, and attaining a new gravito-magnetic equilibrium point.

The theory of everything incorporates a new atomic theory with the above characteristics of electrons.

- **Difference between light or electromagnetic energy and kinetic energy**

Modern Physics does not explain what kinetic energy is and whether it is mass or some other abstract and mathematical force. Given its equations, one would say that it relates to an increase of mass with velocity, and that is about it.

The reticular mechanism of kinetic energy in *Global Dynamics* is a bit harder to explain or understand. To grasp this concept, one must accept, take into account, or internalize the above characteristics of light and mass.

Many experiments confirm the increment in relativistic mass with kinetic energy, living aside the concept of invariant mass, of course.

II.c.4.b) Characteristics and nature of light

In the previous section, we have seen the nature of light from its reality or material support and its relations with mass and kinetic energy.

Now we will complete the nature of light with an analysis of its characteristics concerning movement. Let us note that knowing the nature of light explained in the previous paragraph is necessary to understand the characteristics of propagation of light.

It refers to the characteristics of light about its velocity, derived from the fact that gravity field –luminiferous aether or tension of longitudinal curvature of the filaments of the global aether– is the supporting medium upon which the transverse mechanical waves of electromagnetic energy propagate.

The book *Physics and Global Dynamics* studies the behavior and characteristics of light regarding movement.

These characteristics of light can group in the two following points:

- **The tension of reticular structure of matter as a support medium for light**

  Light travels in vacuum without a need for a support medium, by *Relativistic Physics* and *Quantum Mechanics.*

  As we have seen in the book *Global Mechanics,* one of the characteristics of electromagnetic energy is that it is a transverse mechanical wave upon the tension of the global aether or reticular structure of matter.

The characteristics of light due to its supporting medium, and directly related to its velocity are the following:

- *Constant velocity*

  In Einstein's *Relativity Theory,* the speed of light is constant in vacuum, as a mathematical axiom or theoretical postulate.

  In *Global Dynamics*, the speed of light is constant provided the medium upon which it travels does not change, and neither are any of the characteristics that influence the velocity of the transverse mechanical waves.

  The gravity field is considered the supporting medium of light, and it is a non-dispersive medium. Consequently, if the tension of the longitudinal curvature of filaments, which generates the gravitational potential energy, alters, then the speed of light will change.

- *Maximum velocity*

  In Einstein's theory, the speed of light in vacuum is the maximum speed, as an axiom or theoretical postulate.

  As we have seen, in *Global Dynamics,* the speed of light is variable and, among others, as a function of gravitational potential energy.

  Moreover, it is not maximum as it is additive with the velocity of its supporting medium.

- *Additive speed of light regarding its natural reference system*

  The behavior of light has a special inertia when analyzed from an external point to its natural frame of reference. For us, this natural or privileged frame of

reference is usually the Earth.

Given that, humans are a bit Earth-centered, and that all initial experiments carried out on Earth, the idea of non-inertial nature of light was suitable. By the characteristic of inertia, we mean in the sense that the speed of light it is added to the velocity of its natural reference frame.

Moreover, we say special inertia characteristic, because the speed of light is only additive when measured from outside, because inside its natural reference system it is always the same one, provided the properties of its supporting medium not alter. Light behaves on Earth like the drag of a snake on the wagon of a train, or on the sand on the ground, with the same speed in every direction!

The snake on the wagon only goes faster in one direction than in another when measuring its speed from the ground –or another planet!

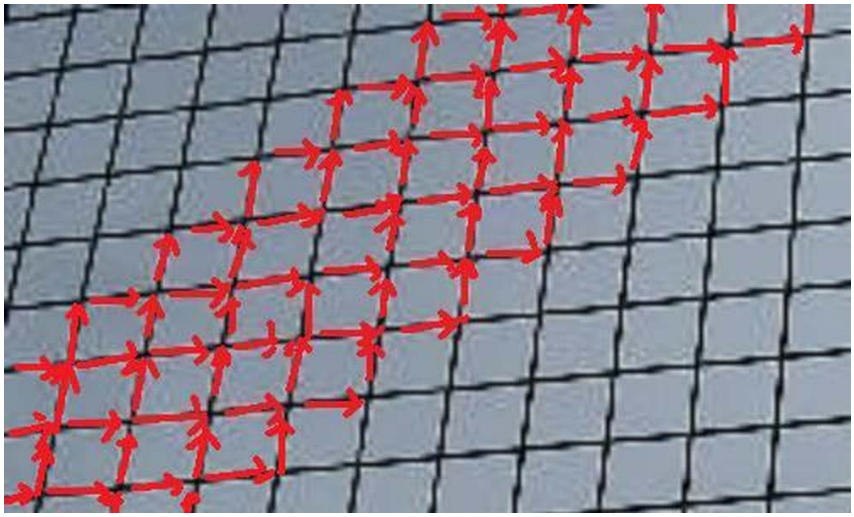
ESA –before was NASA– has scheduled the LISA experiment to try to detect gravitational waves in space. To do this, it will send three spacecraft into space and carry out an interferometry experiment similar to the Michelson-Morley one. The experiment will ultimately confirm the above section, thereby putting an end to Einstein's *Theory of Relativity*.

Among others, the above experiment allows *Global Physics* to be a scientific theory, as it proposes the experimental verification of its affirmations. The book *Scientific Experiments in Global Physics* explains in detail the Distant Michelson-Morley experiment. It is identical to the LISA experiment, initially projected by

NASA.

Luminiferous aether

Photon propagation



- **Light and Newton's Law of Gravitation**

  The propagation of light changes not only by its supporting medium but also by the support medium's characteristics.

  We have just seen that the speed of light is neither constant nor maximum; now we will see purely gravitational effects on the propagation of light.

  One must not confuse this effect of the gravity field on light speed with the curvature effect explained by the book *Law of Global Gravity*. The latter explains in depth why it affects light double than mass.

  Let us see the following natural phenomena:

  - *The curvature of light by stars*

    Einstein's *Relativity Physics* explains the phenomenon of curvature of light with a contraction or expansion of space due to a geometric effect of the continuum, named gravity.

The book of the *Global Law of Gravity* affirms in its section about *Energy Experiments* that this natural phenomenon of curvature of curvature of light and that of gravitational redshift are the same physical phenomenon. The double curvature concerning the hypothetical effect in Newton's *Law of Gravitation* is due to the second component of the *atractis causa* or *Merlin effect,* also explained in the said book.

The book of the *Global Law of Gravity* affirms in its section about *Energy Experiments* that this natural phenomenon of curvature of light and that of gravitational redshift are the same physical phenomenon. The double curvature with respect to the hypothetical effect in Newton's *Law of Gravitation* is due to the second component of the *atractis causa* or *Merlin effect,* also explained in said book.

- *Gravitational redshift*

Einstein's theory explains the characteristic of the gravitational redshift with a temporal dilation.

The section *gravitational redshift of light* of the book *Global Law of Gravity* explains this natural phenomenon with a change in tension of the longitudinal curvature of the filaments of global aether. In particular, the result of the interplay of forces and energies of the supporting medium is additive to light's energy, due to the exchange of internal energy produced.

II.d) Relativistic physics and mathematics

We believe a close notion of Albert Einstein's *Theory of Relativity* is a collection of mathematical curiosities that represent half the physical reality. The other half is *Quantum Mechanics,* with its own collection of mathematical, statistical, and philosophical curiosities. The worst –or best– part is that they are incompatible with each other.

Admittedly, it cannot be simple to invalidate relativistic physics. If it were, we would have known a long time ago, apart from changing the definition of a second, of course!

Frequently, critical comments in the list of *Errors and mathematical curiosities of relativistic physics* refer to, on the one hand, the concepts and not the tiresome Baroque-style formulae, and on the other, interpretations of the facts, not the facts themselves. Regardless, even the facts seem slightly relative when we are talking about Einstein's theories because, on some occasions, they are nothing more than thought examples.

The lack of formulae or complex derivations does not mean that these mathematical curiosities of relativistic physics do not have a great deal of mathematical content. On the contrary, when one understands the subjacent concepts to the formulae, one truly understands the topics at hand, and we would dare to say the math itself too.

The first mathematical curiosity of *Theory of Special Relativity* that interests us is this possible relation:

$$\text{relative fact} = \text{normal fact} * \gamma$$

$$\text{Where } \gamma = \text{relativity} / \text{normality}$$

The *Errors and mathematical curiosities* of relativistic mechanics are interspersed in the rest of the pages of the book; in this section, there is a table with links to the most striking.

Apparently, there is almost unanimity when it comes to the goodness of *relativistic physics*, which means that it is practically a dogma of mathematical faith. It would be good to try to abandon the prejudices, considered as preconceptions, when reading this section; and it would be even better to presume that the criticisms are correct, to compensate the above effect, and to understand mathematical curiosities of relativistic physics with a constructive sense.

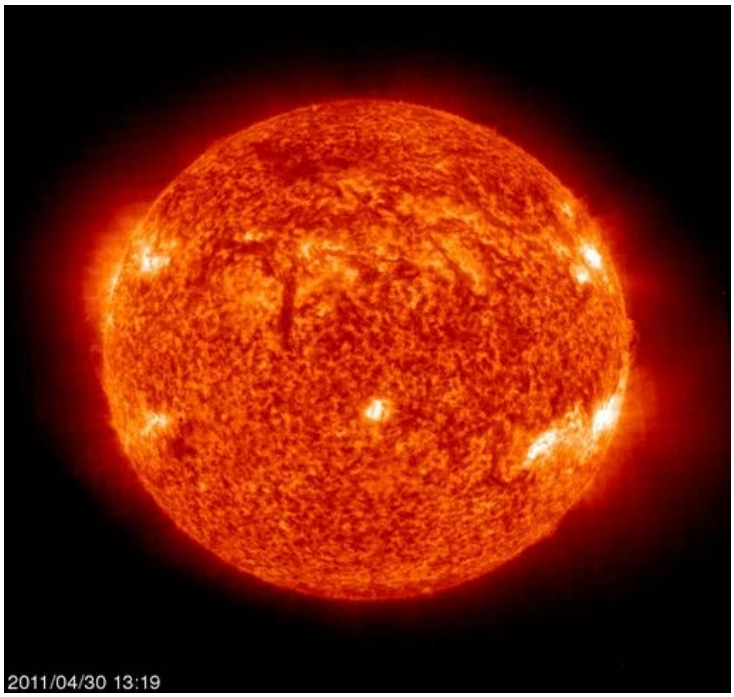
The idea is to reset the history of relativistic physics from the beginning, taking advantage of current culture and trying not to incorporate or presume any conclusion on the premises. To do this, one has to take extra care with terminology and the implicit concepts it might contain.

We do get the impression that the background weaknesses in *Special Relativity* preclude the use of a clear and precise terminology.

Before going into arguments, we would like to point out that the most challenging part will be to separate the real and correct from the incorrect in relativistic mechanics, even if the latter is correct in an imaginary sense. Also, it is hard to understand why individual mistakes or imaginary successes happened and still do.

One may find in the table below some of the most regular errors contained in the uncountable physics experiments that supposedly confirm *Special Relativity*, some cute mathematical curiosities, and some bad habits in the application of the scientific method. Nevertheless, many of these points can include several aspects, and not all of them are here.

Sun spot
Solar and Heliospheric Observatory
(SOHO) NASA
(Public domain image)



The efficiency of the calculus is a fact, despite the errors in conceptual interpretation.

As an example, Einstein's *General Relativity* explains in 1916 the precession of the precession of the perihelion of Mercury with fantastic precision, although in 1898 **Paul Gerber** had explained the precession 20 years before with the same amazing precision. Now, the *Global Physics* does the same using a theoretical model incompatible with relativistic mechanics.

Logically, when the physical nature of an event is unknown, one can always take an easy way out and apply a purely mathematical solution, if one manages to adjust it numerically.

Indeed, the basis for the scientific method collapsed after giving in to the supposed efficiency of relativistic physics,

even if it made no sense whatsoever. Well, we suppose it is not the first time that has happened.

Then it is inevitable; if mathematics invades physics, *Relativity* and its *singularities* appear. When statistics invades it, *Quantum Mechanics* arises, and principles of indeterminacy start popping up everywhere. Finally, if cheap philosophy invades it, Darwinian evolution emerges. *Mutational dimensions everywhere!*

ERRORS AND MATHEMATICAL CURIOSITIES

- **Mathematical curiosities of relativistic mechanics**
  - Heliocentric Model versus Ptolemaic System
  - The Spinning Dancer
  - Non-distinction between physical or real velocity and relative, mental or abstract velocity
  - Discovery in Greece of Pythagoras' Theorem
  - Discovery in America of Special Relativity
- **Conceptual errors of Relativity**
  - The independence of the observer
  - The theory of the ignorant observer
  - Extra-terrestrial observers
  - Confusion with the true subjective relativity of time, love and life
- **Bad habits in the application of the scientific method**
  - Tailored suit of mathematical interpretations
  - Unreal or contradictory hypotheses
  - Metaphorical explanations where the metaphor is the proof itself
  - Quantitative predictions and their measurements in physics experiments
- **Excessive resorting of science to magic**
  - Complexity as an excuse
  - Flat geometry of Euclidean space
  - The magic refuge

* * *

III. Einstein's General Relativity

General Relativity, from 1916, technically includes and changes the *Theory of Special Relativity* of 1905. In this section, we will discuss the new or added subjects, which deals mainly with gravity effects.

Development of *General Theory of Relativity* was necessary to explain accelerated systems and flaws in the *Theory of Special Relativity*. A stellar example would be the twin paradox.

Justification of GR seats on *Einstein's Principle of Equivalence,* publishe in 1911, which relates to the initial relativity of time of the *Theory of Special Relativity*. This principle adds temporal effects to gravity like the temporal effects of relative velocity in inertial systems.

This way, accelerated reference systems and those with gravity are non-inertial reference frames.

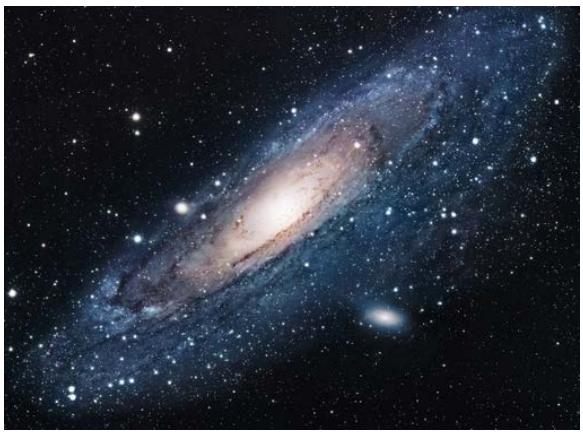
In other words, changes in velocity –acceleration– would be equivalent to changes in the intensity of the gravitational field. Covertly, it establishes a privileged frame of reference: the gravitational field.

The atomic clocks are most significant confirmation of Einstein's theories. The book *Scientific Experiments in Global Physics* comments on various experiments with atomic clocks, which could also make clock time relative, like pressure, temperature, bumping and hammering.

Additionally, the book *Physics and Global Dynamics* enlightens the physical cause why a Cesium atom changes its resonance frequency, both with velocity and with the intensity of the gravitational field.

At the time, when some of the predictions of *General Relativity* confirmed, part of the *Special Relativity* indirectly confirmed because it is part of the former, although in many aspects GR contradicts the original SR.

The spiral galaxy Andromeda
NASA and STScI-Hubble Team
(Public domain image)



If distant Michelson-Morley experiment, proposed by Global Physics, would show that tension of the longitudinal curvature of global aether – gravity field or luminiferous aether– drags light, the GR would practically cease to exist.

Fundamental problem encompassed by Einstein's theories is the time, something whose nature we do not know well. Besides, so far, no one –not even any twin– has come back from the other world. *General Theory of Relativity*, despite its impressiveness and its field equations, never received the Nobel Prize, after so many "empirical contrasts."

At the same time, to say that gravity is a geometric effect of the curvature of space-time is saying a lot. It is not surprising there are still aspects of proving or even understanding, and that after a century it is still said gravity is a force in every school.

Some things are more likely curvatures of language and mental abstractions than physical realities.

- Confusion with true subjective relativity of time, love and life

  In philosophical justification of *General Relativity*, Albert Einstein used on various occasions models of human behavior or emotion, mainly related to love.

  Although we have already dedicated the book *The Equation of Love* to effects of love and other vital emotions on time, I wanted to recall them here as one of the shortcomings. It is one false preconception always present in experiments confirming this theory. The subjective and objective points of view should not mix so often, and neither should physics and metaphysics.

  In other words, if one thinks the time is relative. Any complex mathematical game –such as Einstein's field equations– confirming it will make our mind to accept it straightforwardly. In our opinion, it will be a tremendous error, both material and formal.

  This coincidence of subjective perspective of time with imaginary or fictional perspective in *General Theory of Relativity* is undoubtedly another of the coincidences or circumstances that helped acceptance of aforementioned GR.

A delicate topic is the intuitive vision of GR. When basic concepts of physics are relative, one completely loses this vision, and all problems become almost purely mathematical in Einstein's theories. It is how famous space-time continuum appears, and we go to four-dimensional mathematical space of

Minkowski's geometry in *Special Relativity* and **Riemann's** geometry in *General Relativity*.

If **Minkowski's** geometry adds a fourth axis to the space-time continuum, **Riemann's** geometry curves all four axes. If someone has a particular interest in these topics, he or she could also study **Schwarzschild** metrics; however, let him know that this could produce emotional tensors in his brain, despite having studied simple cases of Einstein's field equations.

The *General Relativity* has undoubtedly achieved to explain some known natural phenomena –like the anomalous precession of Mercury's orbit already explained by Paul Gerber in 1898– and made some predictions, but this does not mean that the interpretations or theoretical justifications of the facts are correct. Indeed, there are interpretations of empirical facts that we consider almost correct, but we consider others wrong.

It is still quite amusing how occasionally there are articles about novel experiments designed to verify *GR*. *There must be a reason for it!*

III.a) The Principle of Equivalence of Einstein's Theory

The basic idea of the *Principle of Equivalence* of *General Relativity* is to apply same temporal effects of acceleration to gravity. This Principle of Equivalence, incorporated by *GR in 1916*, allowed Albert Einstein's theories to justify the second relativity of time, independent from the one defined in *Special Relativity*.

In other words, the effects of velocity upon time and space in *Theory of Special Relativity* (SR) extended to gravitational field in the *General Theory of Relativity* (GR).

Gravity interacts with space by its deformation; this is the known geometric effect of space-time curvature. It is no longer enough to have a four-dimensional geometry of space (such as **Minkowsky's** geometry in SR), it is necessary to curve the axes of this analytical geometry to measure the effect of gravity on space-time in Einstein's theory of 1916.

- The magic refuge

  We get the impression that *General Relativity* adjusted what did not quite fit in *Special Relativity*. If gravity means acceleration, it was easy to imagine a particular equivalence, like thought experiment of the lift.

  Evidently, this second theory deals with the problems and criticisms received in the ten years that separate it from Einstein's *first theory*.

> For example, one can always argue one is in a non-inertial system and thereby invoke Einstein's theory of 1916. All systems are non-inertial to an extent; in many cases, either loss of precision in information assuming that it is inertial is manageable or negligible, or results coincide due to other misleading coincidences.
>
> People do not only resort to GR when an experiment has problems, but also when SR comes into insurmountable contradictions, such as in case of the twin paradox. However, many times we read the solution that relativity offers to it, we do not understand it. Why is not the Earth that suffers accelerations and decelerations instead of the spacecraft, from a purely relativistic point of view? Does *General Relativity* end up saying exactly the opposite to SR when it creates preferred systems of reference by gravity?

We suspect it rings a bell to all of us that it is equivalent to have a constant acceleration to not moving and submitted to a gravitational field. It is the essential idea of the *Principle of Equivalence* and the thought experiment of the lift. However, this example of the lift would work neither for the light nor a person and a gyroscope, because none of them would suffer same gravity force.

Of course, the thought experiment of the lift is just an example. Like the gyroscope!

In my opinion, this *Principle of Equivalence* supposes a simplification of reality, as it concentrates on specific aspects of it, and it seems to forget other energy aspects with possible effects similar –but very different conceptually speaking. Some of these are below:

- Let us note that the *Principle of Equivalence* is only partially

correct, and only from the attraction or pushing force. For example, of movement, acceleration and gravity are not the same; an accelerated body moves and one in a gravitational field does not.

- From an energy point of view, we would also have to take into account equivalences between gravity and pressure. Let us think of gravity in the center of a star; in fact, it could be zero if the sum of the gravitational components canceled each other out. However other properties will not cancel.
- There is certain equivalence between velocity and temperature. See experiment of *Invisible Clock* in the book *Scientific Experiments in Global Physics.*

A negative aspect of Einstein's theory is that incorporates principles instead of explaining the physical causes of the phenomena observed. Even worse, bearing in mind its principles; it forbids searching for particular causes or reasoning.

The books *Global Mechanics* and *Physics and Global Dynamics* present a new theory of everything dealing with matter and movement. They elucidate effects from the *Principle of Equivalence* in Einstein's theory in an alternative fashion, with the interrelation between the mass and the global aether – reticular structure of matter supporting potential gravitational energy, kinetic energy, and mass.

The physical cause of time effects in SR would be variation in mass resonance caused by movement of mass through the global aether. For time effects of gravity in GR would be variation in mass resonance due to the variation of tension exerted by the global aether on mass with variations in the intensity of the gravitational field.

The *Principle of Equivalence* presents gravity effects on mass and energy and manages to explain the predictions of *General Relativity* –although they are more explanations than predictions. Amongst the most famous of these are gravitational lenses, precession of the perihelion of Mercury, and gravitational redshift.

The book *Physics and Global Dynamics* elucidates these same natural phenomena using a new physical paradigm, which does not curve time and space.

Furthermore, if the new theory of everything –alternative to Einstein's theories– explains why atomic clocks alter with velocity and gravity without dilating time, then it seems that Einstein's theories may be incorrect. Even after so much empirical proof!

In other words, it is not that *General Relativity* is the most successful theory, or that its approximation of reality is the simplest one, or that on occasions, this approximation has only formally achieved his goals by changing the definitions of second and meter in 1967. It is that Einstein's theory is incorrect.

Finally, despite its formal achievements, it contains flaws that are experimentally detectable, as they are independent of the above formal conventions, such as dragging of light by a gravitational field or luminiferous aether in the new *Distant Michelson-Morley experiment,* proposed in the book *Scientific Experiments in Global Physics.*

III.b) Predictions of General Relativity

Einstein's predictions are not strictly speaking predictions. At least, the most impressive, the precession of the perihelion of Mercury was a known natural phenomenon. Moreover, Paul Gerber discovers in 1898 the same formula Einstein used. Physicists suspected trajectory of light curved when passing close to stars; the problem was to quantify this phenomenon. Also, we imagine they knew or suspected redshift at the time.

It is undeniable that Einstein had a great imagination and a unique dominance of mathematics. However, the fact that he continued along the path of the relativity of time instead of searching for more clear solutions leads us to think that he did not achieve an overall view. Besides, he might have designed his field equations *ad hoc* to explain curvature of light and precession of the perihelion of Mercury.

The three predictions of GR deduce from its field equations, though their derivation is too complicated for purposes of this exposition. This discussion will be very superficial and will limit to the most famous parts of Einstein's theory, without going into mathematical complexity, which characterizes GR, and all new futuristic theories based on it.

Sometimes, mathematical aspects obscure logical reasoning; if we take them out and we consider them implicitly included in the reasoning, the probability of making conceptual errors will be lower. After all, they are no more than pure mathematics, and that way we avoid tensions in our brain, as we do not need to assimilate unnecessary complex concepts.

The book *Physics and Global Dynamics* offers an alternative

explanation of these predictions under a new paradigm, which maintains Euclidean geometry and absolute time, similar in precision and comparatively much simpler than *GR*.

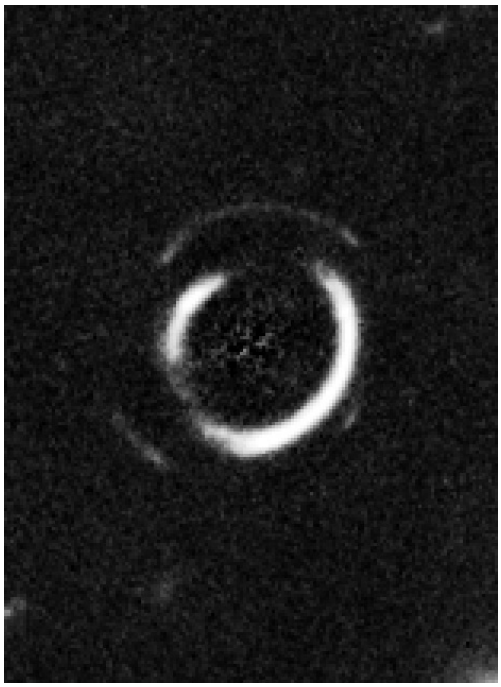
The three most significant predictions in *General Relativity* are the following:

- **Double curvature of light, magnifying or gravitational lenses effect**

  Albert first stated that light deviates when it passes close to massive bodies in equal proportion or angle that Newton indicated in his planet gravitation theory. Afterwards, he corrected to a value exactly double the previous one; – Meanwhile, there were several failed attempts to verify the actual deviation experimentally.

  Gravitational lenses Einstein's double ring NASA

  (Public domain image)

  The only known explanation for this change is mathematical, as it comes from the field equations of Albert's theory. It is a shame he did not pursue the physical causes behind this behavior, as in this quantitative difference underlies one of the most remarkable keys of the new paradigm of the *Global Physics*.

  After various failed attempts –for different reasons– the

solar eclipse of 1919 served to prove empirically that last predictions of Einstein's theory in this sense were correct.

- **The precession of the perihelion of Mercury**

This explanation is undoubtedly the brightest star in the universe: a deviation of 43" arc seconds every 100 years in the axis of planet Mercury orbit. The *General Theory of Relativity* explains it with such a small error that it leaves no room for reasonable doubts about its quantitative correction.

However, we would like to say that in 1898 **Paul Gerber** explained this precession before the relativistic physics with the same exact formula.

The precession of the perihelion of Mercury quantifies by GR thus:

$$ppm = 6\pi \frac{GM}{rc^2} \; radians$$

If in this formula, we were to change the 6 for 2**π,** the precession of the perihelion of Mercury would give the formula proposed by *Global Physics* in the book *Global Gravity Law*. This way, we would have two contradictory theories with no room for reasonable doubts.

Einstein's *General Theory of Relativity* adjusts to observations because, in fact, it gives a double gravitational effect to kinetic energy using its field equations. The first one will cover the hypothetical increase in mass –note the paradox of the invariant mass–, so to keep proportionality in Newton's gravitational law. The second one is an additional effect that instead of applying it to global mass as a gravitational force, applies via a distortion of space. Well, it could be everything is a distortion of the

continuum space-time.

The artificiality of Einstein's theory is due to the impossibility of recognizing right laws of gravity, given its unconditional insistence on the principle of equality between inertial mass and gravitational mass, thereby disregarding and ignoring the material nature of physical mass. Indeed, rather than advance the understanding of characteristics of mass, the *General Theory of Relativity* provoked a total denaturalization of gravity force.

- **Gravitational redshift**

Gravitational redshift (or blueshift) of light implies a lower (or higher) frequency –and thereby lower or higher energy– and it happens when electromagnetic waves approach or move away from the center of a gravitational field.

The book *Physics and Global Dynamics* explains this shift and the curvature of light are both a consequence of energy exchange.

One must not confuse gravitational redshift with redshift produced by relativistic Doppler Effect, due to relative velocities between transmitter and receiver, or with cosmological redshift not yet satisfactorily explained in full.

Relativistic Doppler Effect has always seemed very strange to us; on the one hand, physicists usually say the speed of light is the same for all observers, and on the other, there exists a relativistic Doppler Effect or relativistic redshift.

Of course, it is true that this relativistic Doppler Effect exists whether it is the transmitter or receiver of the wave in motion. Moreover, the calculi of GR offer satisfactory results.

> Lack of semantic meaning comes because it is not possible to take light itself as a relativistic observer. Hence, its analysis seems to have little rationale and has to resort to the familiar temporal dilations.
>
> Although relativistic Doppler Effects justifies itself at the same time as an energy exchange, it happens because of temporal dilation, instead of the correct reason –which is the energy equivalence or exchange due to the relative Euclidean motion.

Although *General Relativity* is mathematically correct –only locally–; we should not accept such an enormous and artificial complexity plus loss of natural physical reality without searching for a more reasonable alternative in line with Ockham's razor.

Making relative time and space is like destroying their natural concepts, so natural that they are in the concept of life itself, which we all have. It would be beautiful for time-travel movies, but it is practically suicidal for the scientific work of neurons.

Indeed, we have two incompatible scientific theories –*General Relativity* and *Global Physics*–, which both explain the three famous predictions. The last thing I want to hear is that the best thing would be to find a midpoint, no, no, no… please, no, never! The midpoint theorem could be a reasonable proposition, *but never as a scientific argument!*

Moreover, the *Theory of Relativity* is incompatible with *Quantum Mechanics*!

Now,

Global Physics includes
Global Dynamics and *Global Mechanics*!

III.c) Einstein's theories and the twin paradox

In a physics book explaining the twin paradox, it says at the end, "… *What happened was that the accelerations of A altered his biological processes, and therefore –when the conclusions of General Relativity for the case of the altered clocks are applied– we find that upon his return, A will be younger than B*…"

Even if this were to be true –which is improbable, given that is an impossible and imaginary thought experiment– it would not have anything to do with the supposed relativity of time.

Perplexed twins

Let us see a counterexample: we have two identical pieces of wood, one of which we leave without moving; the other we drag along the ground at a high velocity, and after a few kilometers, we return it to its original place.

There will be a difference in the apparent "*age*" of the two pieces of wood. However, we are sorry, but we do not see any alteration of time itself.

Likewise, with the twin paradox; one of them would suffer the effect of speed, with alterations in his mass and –following this hypothetical example– his metabolism would alter, and so

he might age quickly (instead of dying of excitement).

However, we still do not see any demonstration when it comes to changes in speed of time, as Einstein's theories state. We all know some animals have a much faster metabolism than ours. Nevertheless, we do not think that they live in a parallel universe or anything like that.

To sum up, although it could ultimately be a correct example, the twin paradox poses three critical problems when it comes to scientific method. The first one, already mentioned above, is that it is a mathematical and unreal example, which deals with vital aspects out of reasonable context.

The second, *Special Relativity* (SR) used a forced language style full of technical connotations and mixed with ordinary and everyday language.

Providing we can swap one twin for another –we suppose that is the idea behind calling it twin paradox– if there is nothing to prevent it –such as in the supposition of *Special Relativity*–, one could never be older than the other could. Indeed, one does not need mathematics for this quick and straightforward reasoning.

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- Metaphorical explanations where the metaphor is the proof itself

  The twin paradox is a well-known paradoxical example that describes Einstein's theories. It also poses most significant problems when it comes to scientific method, as it is a theoretical and unfeasible thought experiment.

  The twin paradox is an intrinsic contradiction to the relativity of time, which has no solution unless applying *General Relativity* (RG). That is to say, creating privileged frames of reference to distinguish between which twin moves or accelerates more. However, this is just opposite meaning of pure relativity.

  Also, SR should always be a particular case of GR; therefore, the solution should have been present in Einstein's first theory.

  In fact, GR says just the opposite to SR in many aspects; in this way, with tailored definitions and with either one or the other, practically everything is explained, both the real and the imaginary.

Einstein's theories are a set of ideas that work. They work because they indeed include some mathematical rules of nature, it cannot be any other way. However, when its mathematical apparatus does not obscure laws of physics, it denaturalizes them completely.

When we have asked authentic experts, "why light deviates double amount in relativity than in Newton's *Law of Gravitation*?" No one has been able to give us any non-

mathematical reason. It must be that no one or almost no one knows the physical meaning behind field equations and their operations for this case.

Regardless, besides very few people understand Einstein's theory, the theory makes one or two serious mistakes, which, as a whole, create a considerable obstacle to the current development of science in this area.

Ptolemy's theory concerning terrestrial geocentrism also worked –until it stopped working–. Einstein's theories mean not only a return to this geocentrism but an accentuation along this line, as they bestow the honor of being the center of the universe upon any point or particle, which they call the observer.

In fact, *General Theory of Relativity* creates a privileged frame of reference, as it situates mass and its gravitational effect in geometry of space-time, though unfortunately for Philosophy, it still inverts definition of gravity concerning its math-physics dichotomy.

To finish this book, here we have a bit of poetic prose. In addition to the innocent twins of the thought paradox, there are particular elements that, to our understanding, want to resign from relativity because they are not happy. We are referring to the following:

- *Love, who's furious*

  Tormented by the chimeric equations. He told us he loves ours!

- *Relativity of time and space*

  One thing is to make time a bit relative, like in the hypothetical case of the Venusian little red dwarf, but quite

another is brutal changes that the poor meson suffers before disintegrating, despite its short lifespan!

Continuing with the meson, it must also have eagle eyes, because it sees every meter as almost sixteen times normal ones.

Indeed, mathematics is a tool for explaining reality. However, to alter reality to such extremes, to solve the math, well, we do not think the little meson quite understands that.

- *The ignorant observer*

  Any observer would wish to be at least as intelligent as we could make him.

- *The pale light*

  Weakened by brightness of fix constants of boredom

- *Gravity, who's sad*

  Locked up and imprisoned in the imaginary tower of mathematical space-time.

- *Science*

  That feels the environmental gap between scientific knowledge and its underlying social understanding.

- *The equivalence*

  That feels unjustly limited and exaggerated, depending on how one looks, thinks or handles it!

Nonetheless, it does not look like a simple task, convincing everybody of errors in Einstein's theories to wipe them from the map –even if they were genuinely mistaken.

As time passes, it becomes a more arduous task; but at the same time, it shows that time is not as relative as many living beings might wish.

All in good time!

* * *

♦

When **Pollwick** finishes the relative book,
he says to **Don Magufo:**

–Why don't we rush and go tell it to **Mª José**?–

Don Magufo answers back:

–Ok, but you know what happened
when we told her you had discovered that
if men are mammiferous, women are penniferous.–


MOLWICK