Questioning the Special and General Relativity

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Abstract. In this paper one revisits several paradoxes, inconsistencies, contradictions, and anomalies in the Special and General Theories of Relativity. Also, one re-proposes new types of Relativities and two physical experiments

1. Introduction.

We have published two books [1, 2] questioning the special and general theories of relativity.

a) In the first book we presented our 1972 **hypothesis that there is no speed barrier in the universe and one can construct arbitrary speeds** - thus refuting the speed of light postulate.

While Einstein considered a relative space and relative time but the ultimate speed of light, we do the opposite: **we consider an absolute time and absolute space but no ultimate speed**, and we call it the Absolute Theory of Relativity (ATR). The ATR has no time dilation, no length contraction, no relativity of simultaneity, and no relativistic paradoxes.

We then **parameterize Einstein's thought experiment with atomic clocks**, supposing that we know neither if the space and time are relative or absolute, nor if the speed of light is ultimate speed or not. We obtain a Parameterized Special Theory of Relativity (PSTR). Our PSTR generalizes not only Einstein's Special Theory of Relativity, but also our ATR, and introduces three more possible Relativities to be studied in the future.

Afterwards, we extend our research considering not only constant velocities but constant accelerations too.

Eventually we proposed a **Noninertial Multirelativity** for the same thought experiment, i.e. considering non-constant accelerations and arbitrary 3D-curves.

b) In the second book we considered that **not all physical laws are the same in all inertial reference frames**, and we gave several counter-examples. We also supported **superluminal speeds**, and we considered that **the speed of light in vacuum is variable** depending on the moving reference frame. **Space and time are absolute** (universal), and separated from each other. Lorentz contraction and Minkovski's metric are unrealistic.

We explained that the redshift and blueshift are not entirely due to the Doppler Effect, but rather to the **Medium Gradient and Refraction Index** (which are determined by the medium composition: i.e. its physical elements, fields, density, heterogeneity, properties, etc.).

We considered that **the space is not curved** and the light near massive cosmic bodies bends not because of the gravity only as the General Theory of Relativity asserts (Gravitational Lensing), but because of the **Medium Lensing**.

In order to make the distinction between "clock" and "time", we suggested a **first experiment** with a different clock type for the GPS clocks, for proving that the resulted dilation and contraction factors are different from those obtained with the cesium atomic clock; and a **second experiment** with different medium compositions for proving that different degrees of redshifts/blushifts and different degrees of medium lensing would result.

In the next sections we revisit several relativistic inconsistencies and we propose new research directions.

2. Multirelativity with Nonconstant Acceleration and 3D-Curves.

In a *3D*-Euclidean space for location and in an *1D*-oriented Euclidean space for time we consider a reference frame F_1 with respect to which a particle P_0 travels with a nonconstant acceleration a_0 on a *3D* curve C_0 in an elapsed time Δt_0.

Then we suppose the reference frame F_1 is moving with nonconstant acceleration a_1 on a *3D* curve C_1 with respect to another reference frame F_2. Similarly, the reference frame F_2 is moving with a nonconstant acceleration a_2 on a *3D* curve C_2 with respect to another reference frame F_3.

And so on: the reference frame F_{n-1} is moving with a nonconstant acceleration a_{n-1} on a *3D* curve C_{n-1} with respect to another reference frame F_n (where $n \geq 2$).

We call this a Noninertial Multirelativity, i.e. the most general case.

2.1. Research Problems on Multirelativity.

a) How would the particle's trajectory curve C_0 be seen by an observer in the reference frame F_n ?
b) What would be the particle's speed (acceleration) as measured by the observer from the reference frame F_n ?
c) What would be the elapsed time of the particle as seen by the observer in the reference frame F_n ?
d) What are the transformation equations from a reference frame to another?
e) Similar questions for rotating reference systems.

Particular cases would be helpful in starting such research, for example studying particles or reference frames travelling on linear curves, or on special curves, with constant speeds or constant accelerations, in reference frames that have one, two, or three parallel coordinate axes. Then later trying to generalize the results.

2.2. Example in Multirelativity of Nonlinear 3D-Trajectories of Particle and Reference Frames.

Since each constant speed v can be considered a constant zero-acceleration with initial velocity v, we treat the general case (i.e. the constant acceleration).

Let's consider in the reference frame F_1 a particle P_0 traveling on a curve C_0 from A to B:

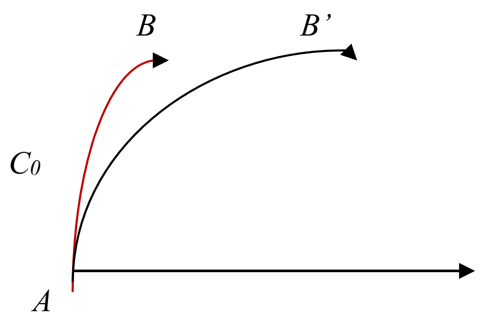

Fig. 1

with a constant acceleration a_0 and initial velocity v_0. Let's take into consideration the earth's gravity g too that influences the trajectory.

F_1 (which has the Cartesian system $X_1Y_1Z_1$) is moving with a constant acceleration a_1 with initial velocity v_1 in the positive direction of the X_1-axis (the OY_1- and OZ_1-axes are parallel respectively with OY_2 and OZ_2) with respect to the frame F_2 (whose Cartesian system is $X_2Y_2Z_2$).

The arclength of AB is noted by d.

From an observer in F_2 the trajectory $\overrightarrow{AB}$ of the particle P_0 in F_1 is seen as a *2D*- or *3D*-curve $\overrightarrow{AB'}$.

The curve AB' is described in F_2 by a function

$$f(a_0, v_0, a_1, v_1, g, C_0, A, B, \theta) = \left(x_2(t), y_2(t), z_2(t)\right) \tag{1}$$

i.e.

$$ArcLength(AB') = \int_0^{\Delta t} \sqrt{\left[x_2'(t)\right]^2 + \left[y_2'(t)\right]^2 + \left[z_2'(t)\right]^2}\, dt \equiv L(\Delta t', \Delta t) \tag{2}$$

where $x_2'(t), y_2'(t), z_2'(t)$ are respectively the derivatives of $x_2(t), y_2(t), z_2(t)$ with respect to t, and $L(\Delta t', \Delta t)$ is a notation to mean that the arclength L, from A to B', depends on Δt and also on d, but d depends on $\Delta t'$.

The distance traveled by the reference frame F_1 in Δt elapsed time is

$$s_1 = v_1(\Delta t) + \frac{1}{2} a_1 (\Delta t)^2 \qquad (3)$$

Supposing that particle's traveling is seen as a constant acceleration by the observer in F_2, then we have:

$$L(\Delta t', \Delta t) = x_{v_0}(\Delta t) + \frac{1}{2} x_{a_0} (\Delta t)^2 \quad (4)$$

where x_{v_0} = the initial particle's velocity as seen by the observer in F_2,

and x_{a_0} = the particle's constant acceleration as seen by the observer in F_2.

We know that in F_1: $|AB| = d = v_0(\Delta t') + \frac{1}{2} a_0 (\Delta t')^2$. (5)

Depending on the suppositions regarding he connections between $\Delta t'$ and Δt (in an absolute time reference frame they are equal), or on the supposition about the acceleration of the particle x_{a_0} and x_{v_0} we get particular cases in formula (1).

The reader can repeat this thought experiment for the case when the accelerations a_0 and a_1 are not constant, and the reference frame F_1 is moving with respect to the reference frame F_2 on an arbitrary *3D*-curve.

3. Length Contraction is Independent of Time

The length contraction is, according to the Theory of Relativity, along the direction of the motion. And if the length is perpendicular on the direction of motion there is no contraction (according to the same theory).

My question is this: it looks that the length contraction is independent of time (according to the Theory of Relativity)!... i.e. if a rocket flies one second, or the rocket flies one year the rocket's along-the-motion length contraction is the same, since the contraction factor

$$C(v) = \sqrt{1 - \frac{v^2}{c^2}} \qquad (6)$$

depends on the rocket's speed (v) and on the light speed in vacuum (c) only. I find this as unfair, incomplete. It is logical that flying more and more should increase the length contraction.

What about the cosmic bodies that continuously travel, do they contract only once or are they continuously contracting?

4. Elasticity of Relativistic Rigid Bodies?

In the classical Twin Paradox, according to the Special Theory of Relativity, when the traveling twin blasts off from the Earth to a relative velocity $v = \frac{\sqrt{3}}{2}c$ with respect to the Earth, his measuring stick and other physical objects in the direction of relative motion shrink to half their lengths.

How is that possible in the real physical world to have let's say a rigid rocket shrinking to half and then later elongated back to normal (as an elastic material)? It is more science fiction…

What is the explanation for the traveler's measuring stick and other physical objects, in effect, return to the same length to their original length in the Stay-At-Home, but there is no record of their having shrunk? Where this quantity of Joules of energy come from in order to shrink and then tacitly elongate back the stick?

If it's a rigid (not elastic) object, how can it shrink and then elongate back to normal? It might get broken in this situation. This is like a science game…

5. Relativistic Masses vs. Absolute Masses

Similarly, the relativistic masses are considered as increasing when traveling at a relativistic speed. But if the object is rigid, doesn't it break?

And, by the way, not all masses are variable, there exist absolute masses in the universe.

6. Miraculous Return to the Original Length!

A rocket has length L at rest, afterwards in flying the length shrinks to $L \cdot C(v)$, then suddenly stops. According to the Special Theory of Relativity the rocket's length $L \cdot C(v)$ tacitly returns to its original length! [As the rocket was made of… plasticizer!]

7. Miraculous Return to the Original Mass!

Similarly, assume the rigid rocket's mass at rest is M; after flying this mass increases to $M/C(v)$. Then, when the rockets stops, according to the Special Theory of Relativity the mass tacitly… returns to its original value (as it was elastic… rocket!).

8. Symmetry and Asymmetry!

In some examples, the Special Theory of Relativity considers a **symmetric** time dilation of two inertial reference frames.

But in other examples, such as in the GPS position system where the satellite clocks are slowed because of the satellite velocity, it considers an **asymmetric** time dilation of two inertial reference frames.
As in the cause of the Twin Paradox, the time dilation was simply… abandoned!
Again an auto-contradiction.

9. Physical and Non-Physical Time Dilation!

The proponents of the Special Theory of Relativity contradict themselves when for some examples they say there is a ***physical*** *time dilation* (e.g. for particle accelerators, *GPS, VBLI, NASA*), and for other examples there is a ***non-physical*** *time* dilation (for interpreting the Twin Paradox).
This is a self-contradiction.
In the Absolute Theory of Relativity [2] one considers an absolute space, absolute time, absolute observer, and superluminal speeds are allowed. Superluminal phenomena do not involve traveling in time, neither objects traveling at c to having infinite masses, nor objects at superluminal speeds to having imaginary masses.
The speed of light in vacuum is not "c" in all reference frames, but varies. It depends on the speed of its frame of reference and on the observer's frame of reference.
Simultaneity does exist and it is objective in nature.
ATR has no time dilation, no length contraction, no relativitistic simultaneities, and all *STR* paradoxes disappear in *ATR*.

10. Density Increasing?

According to the Special Theory of Relativity the mass of a moving object increases with the speed of the object, but what really increases: the object density, the object volume, or both?

Because:

$$Mass = Volume \times Density \quad (7)$$

and since the object length decreases (in the direction of movement), then should we understand that the object volume also decreases?

a) What is the *Mass-Increasing Factor* equal to?

Einstein himself disliked the concept of relativistic mass given by the formula:

$$M(v) = \frac{m}{\sqrt{1 - \frac{v^2}{c^2}}} \quad (8)$$

where m = rest mass,

and M = relativistic mass of the object moving at speed v.

b) What is the *Volume-Increasing Factor* equal to?
c) What is the *Density-Increasing Factor* equal to?

11. The Mass Paradox

The increasing in a moving frame of reference gives birth to another paradox.

If there are $n \geq 2$ simultaneous observers, each one moving with a different speed $v_1, v_2, \ldots,$ and respectively v_n with respect to the body, then the mass of the body has simultaneously n different values, $M(v_1), M(v_2), \ldots, M(v_n)$ respectively in the previous formula, which is impossible and ridiculous in practice, alike in the paradoxism movement.

12. Another Superluminal Thought Experiment

Suppose we have two particles A and B that fly in the opposite direction from the fixed point O, with the speeds v_1 and respectively v_2 with respect to an observer that stays in the point O, as in the below figure:

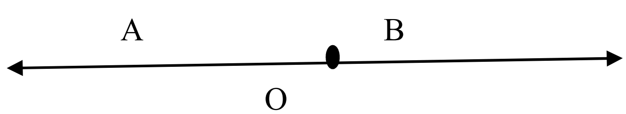

Fig. 2

Let's consider that $v_1 + v_2 \geq c$.

A) But, an observer that travels with particle A (therefore he is at rest with particle A) measures the speed of particle B as being $v = v_1 + v_2 \geq c$.

Similarly for an observer that travels with particle B: he measures the speed of particle A as also being superluminal: $v = v_1 + v_2 \geq c$.

B) If we suppose $v_1 = c$ and $v_2 > 0$, then for the observer that travels with particle A his speed with respect to observer in O is c. But, in the same time, for the observer that travels with particle A his speed with respect to particle B should be greater that c, otherwise it would result that particle B was stationary with respect to observer in O. It results that $c + v_2 > c$ for non-null v_2, contrarily to the Special Theory of Relativity.

C) Let's recall several of Einstein's relativistic formulas:

a) Time Dilation Formula is:

$$\Delta t(v) = \frac{\Delta t^{'}}{\sqrt{1 - \frac{v^2}{c^2}}} \qquad (9)$$

where Δt = non-proper time,
and $\Delta t'$ = proper time.

b) Length Contraction Formula is:

$$L(v) = L'.\sqrt{1 - \frac{v^2}{c^2}} \qquad (10)$$

where L = non-proper length,
and L' = proper length.

c) Relativistic Momentum Formula of an object of mass m, moving with speed v, is:

$$p(v) = \frac{mv}{\sqrt{1 - \frac{v^2}{c^2}}}. \qquad (11)$$

d) Energy Formula of an object at rest, with rest mass m, is

$$E_0 = mc^2. \qquad (12)$$

e) The Total Energy Formula of an object of mass m, moving at speed v, is:

$$E(v) = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}. \qquad (13)$$

f) Kinetic Energy Formula of an object of mass m, moving at speed v, is:

$$E(v) = mc^2\left(\frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} - 1\right). \qquad (14)$$

Let's consider instead of particles two objects *A* and *B* flying in opposite directions as above.

C1) Firstly, when a clock goes at speed *c* with respect to any observer frame, the Special Theory of Relativity breakdown (because time dilates to infinity, length contracts to zero, relativistic momentum is infinity, the total energy and the kinetic energy are also infinite)! One actually gets the indeterminacy *1/0*.
Similarly in Lorentz Relativity for a clock going at speed *c* with respect to the Preferred Frame.

C2) Not talking about superluminal speeds for which, according to the Special Theory of Relativity, the non-proper time, non-proper length, relativistic momentum, total energy and kinetic energy becomes… imaginary!

D) We have hypothesized [2] that superluminal particles do exist and they do not necessitate infinite energy for traveling since the above Einstein's 2.13.C *a)-f)* relativistic formulas are valid in an imaginary space, not in the real one.

13. Another Dilemma about Length Contraction

The distance between Earth and Alpha Centauri (which is the closest star to our solar system) is 4.3 light-years, as measured by an observer on our planet.

A particle travels from Alpha Centauri to Earth at speed $v = c$ (for example a photon) relative to the observer on Earth.

According to Einstein's Special Theory of Relativity:

$$C(v) = \sqrt{1 - \frac{v^2}{c^2}} \in [0,1] \text{ for } v \in [0, \text{c}]. \qquad (15)$$

$$L = L' \cdot C(v), \qquad (16)$$

where L' = proper length (which is the distance between two points measured by an observer at rest with respect to them);

L = non-proper length (distance between two points measured by an observer that is not at rest with respect to them);

v = constant speed of the moving reference frame;

c = speed of light in vacuum.

Therefore the contracted length:

$$L = (4.3\ lightyears) \cdot \sqrt{1 - \frac{c^2}{c^2}} = 0, \qquad (17)$$

which is a contradictory result since the distance between Alpha Centauri and Earth is much far from zero, and even from the reference frame of the moving photon it takes to the photon 4.3 light-years to get to Earth.

14. The Paradox of Simultaneity: Who is the Killer?

We change Einstein's thought experiment on simultaneity in the following way. Let's consider a train moving as below from left to right:

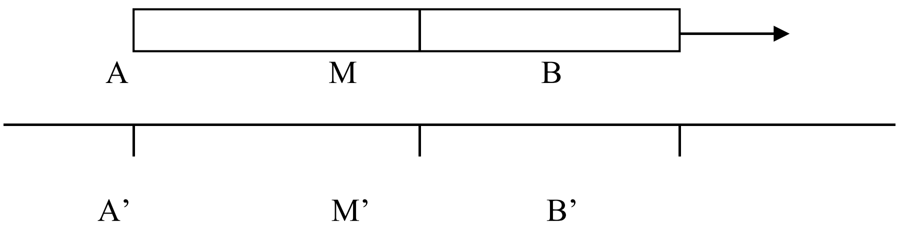

Fig. 3. The Paradox of Simultaneity

And a passenger Marcello in the middle point M of AB. A and B are the end and respectively the beginning of the train. Assume that in the train at the joints A and B there are Alex and respectively Barbara carrying each of them a gun of same caliber and bullet speed. Simultaneously, according to an observer O_t who stays at the midpoint M in the train, Alex and Barbara fatally shoot Marcello in the heart. Therefore according to observer in the train O_t, both Alex and Barbara are guilty of first degree murder, since both their bullets penetrate Marcello's heart in the same time. Therefore Alex and Barbara are both killers.

Let's consider another observer O_e on the embankment, who sits at the midpoint M' which coincides with M. Similarly on the embankment the points A' and B' coincide respectively with A and B. According to the observer on the embankment, O_e, upon Einstein's Special Theory of Relativity because the train moves from left to right, Barbara's bullet penetrates Marcello's heart and kills him before Alex. Therefore Barbara is a killer.

But Alex is not a killer, since his bullet arrives later than Barbara's, therefore Alex's bullet penetrates a dead body (not a living body). According to the observer on embankment, O_e, it's Barbara who fired the gun before Alex did.

Contradiction.

14.1. The Dilemma of Simultaneity

Let's consider two entangled particles *A* and *B* flying in the opposite directions. Let's assume they are so far away that light needs much time to travel from *A* to *B*.

If *A* is in state *s*, it instantaneously causes *B* to be in state *s* too.

We disagree with Theory of Relativity's statement that there are no influences that travel faster than light.

According to the Special Theory of Relativity we have:

A) For an observer O_1, traveling with particle A at time t, the event "A is in state s" occurs before the event "B is in state s".
B) For another observer O_2, traveling with particle B at time t, the event "A is in state s" occurs after the event "B is in state s".
C) But these two observers are in contradiction with a quantum observer O_3, which sits in the point M, where the particles started to fly from. O_3, measuring particle A to be in state s at time t, will automatically know that particle B is in state s as well. Therefore, for the quantum experimenter O_3 the particles A and B are simultaneously in the state s.

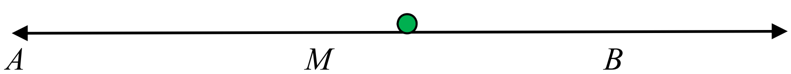

Fig. 4

14.2. Relativity of Simultaneity is Just an Appearance

In general let's consider two simultaneous events in a reference frame at rest with respect to the events.

In a moving reference frame, the same events don't look simultaneous, but this is only an appearance, a subjective impression.

In our Absolute Theory of Relativity we have no relativity of simultaneity.

15. Minowski's Spacetime in Heterogeneous Medium

In general, let's consider two simultaneous events in a reference frame at rest with respect to the events. In a moving reference frame the same events don't look simultaneous, but this is only an appearance.

Let's consider the locations $L_1(x_1, y_1, z_1)$ and $L_2(x_2, y_2, z_2)$ and times $t_1 < t_2$. The spacetime distance between the events $E_1 = \{I\ bread\}$ at (x_1, y_1, z_1, t_1), and $E_2 = \{I\ bread\}$ at (x_2, y_2, z_2, t_2) gives the answer:

$$d^2(E_1, E_2) = c^2(t_2 - t_1)^2 - [(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2] \tag{18}$$

Let's say that $d(E_1, E_2) = 0$, then $d(E_1, E_2)$ means that light has travelled in vacuum from location L_1 to location L_2 in the period of time $t_2 - t_1$.

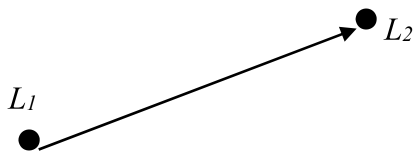

Fig. 5

But we see no connection between the fact that "I bread" and the fact that "light travels in vacuum on a distance equals to $|L_1L_2|$"!

Let's change this thought experiment and suppose that both locations $L_1(x_1, y_1, z_1)$ and $L_2(x_2, y_2, z_2)$ are under water, somewhere in the Pacific Ocean. Now light in the water has a smaller speed (c_w) than in vacuum, i.e. $c_w < c$. Therefore within the same interval of time $t_2 - t_1$, light travels in the water a lesser distance than L_1L_2. Thus $d(E_1, E_2)$ has a different representation now L_1L:

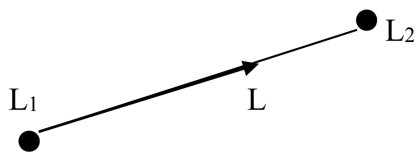

Fig.6

And, if instead of water we consider another liquid, then $d(E_1, E_2)$ would give another new result.

Therefore, if we straightforwardly extend Minkowski's spacetime for an aquatic only medium, i.e. all locations $L_i(x_i, y_i, z_i)$ are under water, but we still refer to the light speed but in the water (c_w) then the coordinates of underwater events E_w would be $E_w(x_i, y_i, z_i, c_w, t_i)$ and Minkowski underwater distance would be:

$$d_w^2(E_{w1}, E_{w2}) = c_w^2(t_2 - t_1)^2 - [(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2] \tag{19}$$

But if the underwater medium is completely dark it might be better to consider the speed of sound as aquatic animals used in order to communicate (similarly as submarines use sonar). Let's denote by s_w the underwater speed of sound. Then the underwater events $E_{ws}(x_i, y_i, z_i, s_w.t_i)$ with respect to the speed of sound would have the Minkowski underwater distance:

$$d_{ws}^2(E_{ws1}, E_{ws2}) = s_w^2(t_2 - t_1)^2 - [(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2] \tag{20}$$

Similarly for any medium M where all locations $L_i(x_i, y_i, z_i)$ are settled in, and for speed of any waves W that can travel from a location to another location in this medium.

15.1. Spacetime Diagram Didn't Take into Account the Medium Composition

The problem becomes more complex when one has a heterogeneous medium and the waves travel with a speed v_1 in a part and another speed v_2 in another part, and so on [we mean the speed of light in liquids, in plastic, in glass, in quartz, in non-vacuum space in general]…

15.2. The Spacetime-Interval does not Distinguish Between Events' Nature.

If an event E_1 occurs at location $L_1(x_1, y_1, z_1)$ and time t_1, and another event E_2 occurs at the location $L_2(x_2, y_2, z_2)$ and time t_2, with $t_1 \leq t_2$, in the Minkowski spacetime, the squared distance $d^2(E_1, E_2)$ between them is the same and equal to:

$$\Delta s^2 = c^2(t_2 - t_1)^2 - [(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2] \quad (21)$$

no matter what kind of events we have!

For example, if one has the event *E1={John drinks}* and the event *E2={George eats}*, there is no connection between these two events. Or if one has two connected events: *E1={Arthur is born}* and *E2={Arthur dies}*. There should be at least one parameter [let's call it "*N"*] in the above (Δs^2) spacetime coordinate formula representing the event's nature.

15.3. The Real Meaning of the Spacetime-Interval

The spacetime interval is measured in light-meters. One light-meter means the time it takes the light to go one meter, i.e. $3x10^{-9}$ seconds. One can rewrite the spacetime interval as :

$$\Delta s^2 = c^2(\Delta t)^2 - [(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2]. \quad (22)$$

There are three possibilities:

a) $\Delta s^2 = 0$ means that the Euclidean distance L_1L_2 between locations L_1 and L_2 is travelled by light in exactly the elapsed time Δt. The events of coordinates (x, y, z, t) in this case form the so-called light cone.

b) $\Delta s^2 > 0$ means that light travels an Euclidean distance greater than L_1L_2 in the elapsed time Δt. The below quantity in meters:

$$\Delta s = \sqrt{c^2(\Delta t)^2 - [(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2]} \quad (23)$$

means that light travels further than L_2 in the prolongation of the straight line L_1L_2 within the elapsed time Δt.

The events in this second case form the time-like region.

$c)\ \Delta s^2 < 0$ means that light travels less on the straight line L_1L_2. The below quantity, in meters:

$$-\Delta s = \sqrt{-c^2(\Delta t)^2 + [(\Delta x)^2 + (\Delta y)^2 + (\Delta z)^2]} \tag{24}$$

means how much Euclidean distance is missing to the travelling light on straight line L_1L_2, starting from L_1 in order to reach L_2.
The events in this third case form the space-like region.

We consider a diagram with the location represented by a horizontal axis *(L)* on $[0, +\infty)$, the time represented by a vertical axis *(t)* on $[0, +\infty)$ perpendicular on *(L),* and the spacetime distance represented by an axis (Δs) perpendicular on the plane of the previous two axes. Axis (Δs) from $[0, +\infty)$ is extended down as $(-\Delta s)$ on $[0, -\infty)$.

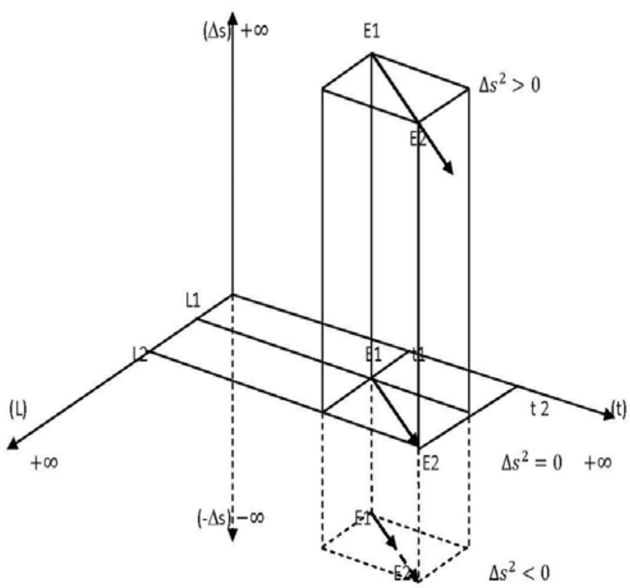

Fig. 7

16. Relative or Absolute?

It is strange the fact that the space is considered relative and time also relative in the Theory of Relativity, but the so-called spacetime is absolute; this is an oxymoron.

Transforming time into space, or reciprocally, is just a funny concoction, but unreal.
Since the spacetime is absolute, it is not clear if anything is relative in the Theory of Relativity or not?

17. Controller is not Aware

Let's assume that the controller is not aware of the flying rocket. Then does it still exist a time dilation for the controller and space contraction for the astronaut? The relativists again say that it is "meaningless" (undecidable). But what kind of theories give birth to undecidable propositions? Incomplete or inconsistent theories.

18. Distorted Bodies

By space contraction, the bodies are distorted, i.e. the proportions are not kept and angles in general are not invariant (only the right angles formed by body's edges perpendicular on other body edges along the motion are invariant). For the right triangle:

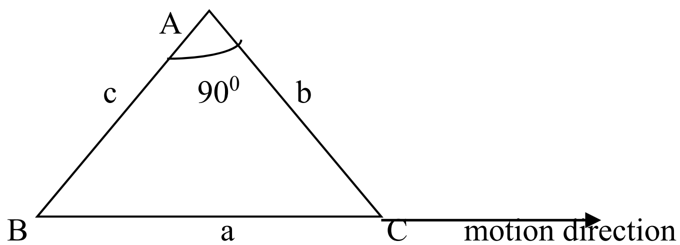

Fig. 8

$a^2 = b^2 + c^2$ with $\measuredangle A = 90^\circ$, but after lengths' contraction, the edges become:

$$a' = a \cdot C(v) \qquad (25)$$

$$b' = b \cdot OC(v, \theta) \qquad (26)$$

$$c' = c \cdot OC(v, 90^\circ - \theta) \qquad (27)$$

But in general

$$(a')^2 \neq (b')^2 + (c')^2, \text{ so } \measuredangle A' \neq 90^\circ, \text{ or } \measuredangle A' \neq \measuredangle A. \qquad (28)$$

19. Pure Gravitational Field?20

The General Theory of Relativity asserts that it is possible to have a pure gravitational field, without any matter at all, which acts as a source for itself.

Then the following questions arise: What does happen to the cosmic travelling small, medium and massive objects to the atomic and sub-atomic particles in this pure gravitational field? Do they fall to the bottom of the pure gravitational field, and do they eventually form a compact cosmic body whose own gravitational field is this pure gravitational field?

Does it exist any experiment proving that gravity influences light speed or light trajectory? Does indeed gravity attract light?

{The light escaping or not a gravitational field in General Theory of Relativity or in a Black Hole can be considered if it has been experimentally proven that light is influenced by gravity.}

Also, if *mass produces gravity* and *gravity produces mass*, then it results that pure gravitational field will produce/generate some mass. How? Will objects, dust, particles be attracted in and condensed into a compact body inside of this pure gravitational field?

20. Other Pure Fields?

As a generalization of the previous Pure Gravitational Field, is it possible to have a Pure Magnetic Field, or Pure Electric Field, or Pure Electromagnetic Field, etc. without matter in its proximity?

21. Conservation Law for Gravity?

A) If a planet explodes or is destroyed, what does happen to the planet gravitational field? Does it disappear? Does there exist a conservation law for gravity?

For example: If a planet is split into $n \geq 2$ parts, will the planet gravitational field be also split among these n parts?

Is the gravitational field conserved or transformed? If transformed, would it be into energy?

22. What Happens to the Curved Space around a Massive Object that has been Destroyed?

A) According to the General Theory of Relativity the space is curved around a massive object. Then, after the planet explodes (due to internal forces) or destroyed (because of external forces) does the space around it still remain curved or does it straighten back to flat?

How would the disappearance of a planet impact the other planets? Will its orbit be occupied by another cosmic object that might be forming from residues that fall into this orbit?

B) If space is curved around a star and forms tracks that planets travel following these tracks as rail-roads, why not other (small, or medium, or massive) objects are falling into these tracks and traveling around the star on the same orbits?

23. What Happens to the Planets that Orbit a Star that has Died?

If a star explodes or is destroyed or dies, what happens to the planets that orbit it? Will they continue to orbit by inertia the point where the star used to be? For how long time?

24. Is Time an Entity without Beginning and Ending?

Is there a beginning and ending of time? Or is the time an entity without ending or beginning?

We dough the Big Bang Theory that asserts a *creatio ex nihilo* of the Universe…

If it was a point in the Big Bang that exploded, where did this point come from? What was before that point?

25. Creating Gravity

Massive cosmic bodies create gravity. Is there a bound for such cosmic bodies (depending on mass, volume, density, and may be position) starting from which cosmic bodies create gravity, while below that bound they don't create gravity?

26. Not All Physical Laws are the Same in All Inertial Reference Frames

A. *Different Inertial Values for a Moving Object*.
   The laws of physics are not the same in all directions for a moving object according to the Special Theory of Relativity,
   since lengths which are oblique to the direction motion are contracted with the oblique-factor $OC(v,\theta)$,
   while the lengths along the motion direction are contracted with a different factor C(v),
   but lengths that are perpendicular to the direction motion are not contracted at all;

   which require different inertia values for the moving object.

B. *There are universal constants that are not quite "constant" throughout the universe*.
C. Would it be possible to get physical systems where the energy conservation law doesn't hold?
D. Would it be possible to get physical systems where the Earth's physical laws are invalid?
   Maybe our laws are only local, but non-local laws may apply in other galaxies.
   We believe on other planets, or in other solar systems, galaxies the laws of physics are not the same.
   The Laws of Physics are influenced by the medium composition, velocity, etc. of the frame of reference.

27. Back in Time?

If the time runs faster at the top of a gravitational field than at the bottom of a gravitational field, then sending a signal from top down could be like a message sent back in time, which is unrealistic!

28. Wormholes do not Exist in a Real World

The Wormholes were predicted by the Theory of Relativity [through Hermann Weyl in 1921 and John Archibald Wheeler in 1957], but the Wormholes permit time travel (that is unrealistic) and violate the causality.

The Wormholes can be valid in an imaginary space only.

29. Newton's Physics or Einstein's Metaphysics?

Is it any threshold of the speeds, let's say $\alpha \cdot c$, with $\alpha \in [0,1]$, such that for the speeds $0 \leq v \leq \alpha \cdot c$ we apply Newton's Physics, and for the speeds $v > \alpha \cdot c$ we apply Einstein's Special Relativity?

The proponents of Special Relativity say that Einstein's Velocity Addition Formula

$$v_1 + v_2 = \frac{v_1 + v_2}{1 + \frac{v_1 \cdot v_2}{c^2}} \qquad (29)$$

prevails for any speeds. But this formula fails for superluminal speeds.

30. Neither *2c* is a Speed Limit

We do not agree with the *Lorentz Relativity* and *the Lorentz Ether Relativity* that support superluminal speeds up to a limit of *2c,* although the absolute velocities are added using normal arithmetic in these two Relativities. We think there can constructed speeds that overpass *2c* as well.

31. Subjective Dilation-Time

For two observers, in two moving referential frames, each one sees a time dilation for the other (time-dilation symmetry). But this is clearly a *subjective time dilation*, not an *objective time dilation*.

These symmetric time dilations cannot be simultaneously done in practice; it is absurd.

32. Subjective Local Time vs. Objective Global Time

The proponents of the Theory of Relativity assert that the so-called black hole is so powerful, that even the time itself is brought to a stop. But this looks very much as science fiction, since the objective time goes on anyway.

33. Relative vs. Absolute Space and Time

Einstein says that there is no absolute space or absolute time. But we argue that we can mathematically consider an absolute space and absolute time, in order to eliminate all paradoxes and anomalies from Theory of Relativity.

Relative Space and Time are referring to Subjective Theory of Relativities, while Absolute Space and Time are referring to Objective Theory of Relativity {see the Absolute Theory of Relativity [2]}.

The observers are relative, subjective indeed, but mathematically there can be considered an *Absolute Observer*. {There are things which are absolute.}

34. Contraction of the Universe?

If the Universe is expanding (therefore moving), according to the Special Theory of Relativity it should be contracting along the moving direction.

Continuously moving bringing continuously contracting?… therefore until getting back to a point (as the supposed original Big Bang)?

35. The Michelson-Morley Null Experiment was not quite Null

While the establishment interpreted the result of Michelson-Morley Experiment as null, many other researchers considered it as not quite null.
The supposed Michelson-Morley *Null* Experiment instigated the physical theorists to invent Relativity Theories with abnormal/non-practical length contraction, time dilation, mass increase, etc.

36. Variable Speed of Light in Vacuum

The speed of light in vacuum is not invariant as seen by different frame of reference observers. It depends on the light source and its frame of reference.

Its addition with other speeds follows the classical law of velocity addition.

37. Instantaneous Acceleration?

In all paradoxes involving movement it is supposed that something goes at a constant uniform speed. One assumes a so-called "instantaneous acceleration": it is considered the ideal case when jumping from zero velocity directly to velocity v, and similarly jumping back from v to zero velocity when stopping.
Therefore, many Thought Experiments are just approximations, no matter how large is the segment of constant speed with respect to the acceleration segment, because one cannot get to the constant speed without starting from zero speed.

38. Where the Extra-Mass Comes from?

Relativistic Mass increases with speed according to the Theory of Relativity. But an elementary question arises: where the extra-mass comes from?

Also, how the extra-mass was produced? Where did the extra-energy come from?

Assuming that the initial mass has a charge, then does the increased mass have the same charge?

39. Space is Not Curved

For a *1D*(one-dimensional)-curve one can see its curvature in a *2D*-space.

For a *2D*-surface one can see its curvature in a *3D*-space.

But how to see the curvature of a *3D*-body, since there is no *4D*-space in the real world? {We do not talk about the spacetime which has dimension four, since the spacetime is unreal.}

Some physicists assume the possibility of hidden dimension(s), but such things have not yet been found.

Since there is no *4D*-space in the real world (time is not taken into consideration since it is an independent entity), the *3D*-space cannot be curved.

40. Black Hole is an Imaginary Cosmic Body

Since the Black Hole purely aroused from the mathematical solution by Schwarzschild (and Hilbert) to the Einstein's Field Equations, and because Einstein's Field Equations do not describe the real universe, the Black Hole is so far just an imaginary cosmic body (or the notion of "black hole" has to be redefined).

While the Black Body, for example, is a theoretical ideal (not entirely realized in practice, but only approximated…), which has not at all the power of reflecting light, the relativists consider the Black Hole as a physical object (!)

41. Fact or Mathematical Artifact?

Interestingly, even the Black Hole's center, which is a point of infinite density and zero volume (which looks fantastic!), is considered a real physical entity, although clearly it is a mathematical artifact.

42. What is the Maximum Discovered Density in the Universe?

Since no experiment has ever shown a density being infinite for a physical object in the universe, our question is what would be the maximum discovered density in the universe? Would it be possible to create any given density?

43. Maximum Strongest Fields?

a) What is the strongest gravitational field in the universe?

What would be the maximum gravitational field to be produced in the laboratory?

b) Similarly, what is the strongest electric field in the universe?

What would be the maximum electric field to be produced in the laboratory?

c) Similarly, what is the strongest magnetic field in the universe?

What would be the maximum magnetic field to be produced in the laboratory?

44. How to Compute the Mass of a Singularity Point?

Let's consider the Black Hole's singularity that occurs for $r = 0$ in

$$g_{00} = \left(1 - \frac{2Gm}{c^2 r}\right)^{1/2} \qquad (30)$$

where

m = mass of the spherically cosmic body;

G = gravitational constant of the body;

r = distance from the cosmic body to the clock;

c = speed of light in vacuum;

and represents, according to the relativists, an *infinitely dense point-mass* that is at the center of the Black Hole.

It is not clear how to compute the mass of this singularity, since

$$Mass = Volume \times Density =$$

$$= 0 \times \infty = 0, \infty, \text{ or another value?}$$

(31)

Another singularity occurs for

$$r = \frac{2Gm}{c^2} \qquad (32)$$

in

$$g_{11} = \frac{-1}{\left(1 - \frac{2Gm}{c^2 r}\right)^{1/2}} \tag{33}$$

And it is considered by relativists as Schwarzschild radius of a Black Hole, or the radius of the event horizon.

45. Mute Body

What about a cosmic body whose escape speed would be greater than the speed of sound (instead of the speed of light)? Therefore, no sound would come out from that body, so it would be labeled as "mute body"!

46. Travel in Time is Science Fiction

Relativists also support the travel to the past and travel to the future. But these are not possible in reality (see the *traveling time paradoxes*, where travelers change the past or the future). Because, for example, if somebody has changed the past, we don't know which one was the real past, the original one or the changed one? It is not possible to have two or pasts!

Relativists conclude that it is possible to travel in the future in the real world, because when we board an aircraft, for example, we are moving with respect to those who remain behind, therefore our time will pass slowly compared to those who remain behind. But this is an illusion since according to the absolute observer time is the same in moving or staying reference frame. Maybe the biological or subjective time changes, but not the objective time.

47. Time Coming to a Halt?

According to the relativists, when

$$\left(1 - \frac{2Gm}{c^2 r}\right)^{1/2} = 0 \tag{34}$$

the time would come to a halt, because Schwarzschild's solution to Einstein's Field Equations for a spherically symmetric body shows that the rate of the clock is reduced by the factor

$$\left(1 - \frac{2Gm}{c^2 r}\right)^{1/2}. \tag{35}$$

But in the real world this is fantasy!

48. No Wormholes

Therefore, Einstein-Rosen Bridge, as a solution to Einstein's Field Equations, which allegedly connects different regions of the universe and just could be used as a time machine, is just fictitious.

49. Escape Velocity

The escape velocity from an alleged Black Hole is

$$c = \sqrt{2Gm / r}\ . \qquad (36)$$

But in the future technology, it would be able to accelerate a photon inside of a Black Home's event horizon to have it travels at a speed greater than c. Also the superluminal particles would escape.

Thus the Black Hole would not be black any longer.

50. What about more Cosmic Bodies?

Schwarzschild considered only one cosmic spherical body when solving Einstein's Field Equations. But, what about more cosmic bodies (or more Black Holes)?

51. No Universe Expansion since Earth is not the Center of the Universe

Hubble's Law (1929) says that all galaxies are moving away from Earth at a velocity which is directly proportional to their distances from Earth. It presumes that, due only to the velocity at which the galaxies are moving away from the Earth, one has the redshift.

Yet, it looks that Hubble's Law is not followed by the *quasars*, which have big redshifts, emit large amounts of energy and lie behind our Milky Galaxy.

According to Hubble's Law, the *universe is expanding*, and the velocity of a receding galaxy with respect to our Earth is

$$v = H_0 \cdot D \qquad (37)$$

where H_0 = Hubble's Constant, and H_o is between 50-*100* (typically *70*) km/sec per megaparsec (*3.26* million light-years);

and D = distance from the galaxy to the Earth.

But, if the galaxies recede with respect to the Earth at a velocity proportional to their distances from Earth, it involves that our Earth is, or is becoming, the center of the universe.

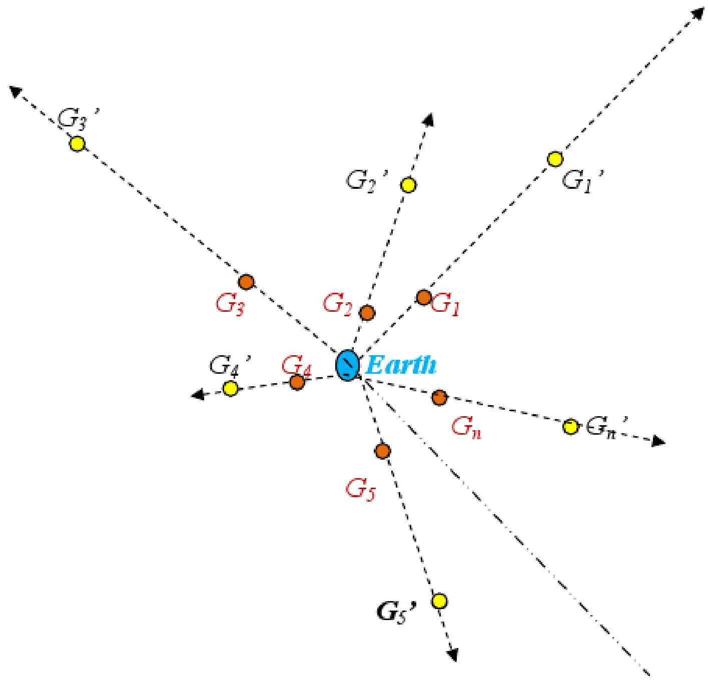

Fig. 9. Diagram of Allegedly Expansion Universe

In the above diagram, the Earth stays in the expansion center, and G_1, G_2, ..., G_n, ... are galaxies, while G_1', G_2', ..., G_n', ... are respectively their expansion positions after a certain t_1. The diagram is continuously extended in all directions, according to Hubble's Law, and after times t_2, t_3, ... the corresponding new positions of the galaxies would respectively be G_1'', G_2'', ..., G_n'', ... at time t_2, then G_1''', G_2''', ..., G_n''', ... at time t_3, etc. the galaxies getting further and further from the Earth, i.e. pushing the Earth closer and closer to the center of all galaxies.

Even if Earth was not the center of the universe at the alleged Big Bang, after such permanent expansion of the universe with respect to the Earth, it would result that the Earth is in process of becoming the center of the universe… But the experiments do not show that.

52. Photon's Wavelength Stretching and Shrinking?

The photon is considered of having a dual form: wave and particle.

If the photon is a wave, it has been asserted that the photon's wavelength is stretched inside the intergalactic space, because of the expansion of the universe. But what happens with the photon's wavelength when the photon enters a galactic space (which is not expanding), and afterwards it exists the galactic space and enters an intergalactic space (which is expanding), and so on?

But, when the wavelength increases the wave frequency decreases (redshift); therefore the wave's momentum and energy are diminished in the expansion of the universe. It seems to be an antithesis between the quantum mechanics (Copenhagen style) and the universe expansion.

If the photon is a particle, similarly because of the so-called expansion of the universe, does its pathlength increases inside the intergalactic space (which is expanding) and decreases inside the galactic space (which is not expanding)? Thus, what happens with its pathlength when the photon passes from an intergalactic space to a galactic space, then again to intergalactic space, and so on?

53. White Holes?

From Einstein's Field Equations one can also deduce the so-called White Holes, which are opposite to the Black Holes, and their property is that things are spewing out from the While Holes. But then if all matter is spewing out, as in antigravity, then the White Hole would contain no matter at all. Will it then remain only as a pure antigravity field? Very strange cosmic object…

54. Scientific Perversity

If data obtained from any experiment or application matches the Theory of Relativity, then that type of data is considered covered by and supporting the Theory of Relativity.

But, if such data does not match the Theory of Relativity predictions, then it is considered as not covered by the Theory of Relativity, and therefore (!) not contradicting the Theory of Relativity.

All pretended tests of General Relativity can be solved without using the General Relativity.

That's why it became a break in the developing of science since every experiment and theory has not to be in conflict with Einstein's Theory of Relativity, which became a fictitious theory producing confusions, ambiguities and self-contradictions. Unfortunately the optical illusions were taken for realities…

An untrue hypothesis that "the speed of light is constant in vacuum in all reference frames (no matter with what uniformly moving speeds!) in all directions" generates a theory whose consequences are weird, non-common sense, even anti-logical and unrealistic. From invalid postulates one gets ridiculous conclusions like in comic stories.

The physicists dream too much and suddenly they invent fantasy theories and require us to take them for granted.

Theories that produce fantastic consequences are fantastic themselves.

Einstein's Relativity is more a science game than reality.

Lorentz Transformation is just a distortion factor of the reality.

The *Gravitational Waves* have not been discovered.

Einstein's Field Equations and *Pseudotensor* are valid in an imaginary space only. There is no proof that Einstein's Field Equations do not violate the common law of conservation of energy and momentum.

Other times, in order to bridge the gap between the Theory of Relativity and experimentally found data, all kind of strange things and ideas are invented.

Instead of fitting the theory to better describe the reality, the reality is distorted in order to fit into the theory!

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