A unique reality

Relative vs. Absolute - the end of the battle

Laurențiu Mihăescu

Bucharest, Romania

Third edition, March, 2019

www.1theory.com

Table of contents

1. Introduction

The reality that surrounds us is based on a very simple mechanism, as it was already described in my first book, 'Prime Theory'. A few exact rules may describe exhaustively its intrinsic mechanics, up to the largest cosmological scales. Among them, causation occupies a very important place and gives humans, as rational beings, the special possibility to fully understand everything. Precise theoretical models allow us to cover the whole story of the Universe, since the very beginning, to understand its evolution and to make predictions for the near and distant future.

A lot of theories and models of the modern physics, even the strange ones, often give extraordinary results in limited areas, such as the Standard Model for quantum physics or the GTR for macroscopic physics. However, a "theory of everything" is missing in this picture; this kind of theory is definitely required to harmonize the current models of reality - as we are dealing, obviously, with a *unique reality* and a set of *unique rules,* no matter the scale.

Thus, 'Prime Theory' was intended to be a complete model of reality: it formulates the rules governing our Universe at any scale, reveals the initial absoluteness and its reflection in all material structures and shows the common denominator of gravity and fields. Moreover, the 'Theory of the Absolute' even allows the integration of the well-known 'Theory of Relativity' into this new paradigm.

All these visions on a unique reality should lead to a unique descriptive framework, both physically and mathematically. We cannot apply TR in any context, ignoring the absolute that characterizes the movements of matter. It is impossible to have, at the same time, a functional framework for relative movements, where any IFR is perfectly equivalent to another - describing in this way a kind of self-closed, limited universe (however elegant would be this concept), and a framework based on absolute at any scale, where the granular movements determine the state and functionality of all material structures, generating a global spatial nonuniformity. Definitely, there is a speed limitation in our Universe; it is not directly related to the speed of light in a vacuum, but to the absolute granular speed. Similarly, an object cannot move at any "speed" through the so-called space-time continuum, and this limitation also originates at granular level, being of absolute nature.

2. The basic assumptions of TR

Let's consider this big laboratory named Earth, a place where we can make almost any type of scientific experiments. Here are the general conditions of this lab, seen now as a frame of reference:

- The rotation of our planet around its own axis (0.46 km/s) plus the revolution around the Sun (at about 30 km/s). Moreover, our solar system rotates around the galactic center while it also moves, along with the entire galaxy, with a constant speed (relative to the CMB); overall, we might consider that Earth has an absolute movement, uniform and linear, at about 400 km/s. This velocity will vary slowly in time, as both direction and value, and these changes can easily be measured. However, the whole system can be regarded as being inertial over short periods of time.

- Dense atmosphere (but transparent), made up especially of oxygen and nitrogen; the atmospheric pressure is approximately 760 mm Hg, and the refractive index is 1.000293 for light (λ = 589 nm).

- Weak gravitational field, a relatively constant gravitational acceleration (9.81 m/s^2) on the surface.

This local "universe" allowed physicists to measure the speed of light, more and more precisely, and to eventually declare it a constant. Therefore, an exact value was established for the speed of light in a vacuum, 299 792 458 m/s. Having regard of the refractive index above, the speed of light in the air reaches the value of 299 702 547 m/s - about 90 km/s slower than **c**.

There have been many measurements (performed in open air and in ultra high vacuum systems) in which scientists like Michelson and Morley tried to detect the slightest variation of the speed of light. In essence, all these measurements have generated almost constant values for this speed, which are not depending on the direction of propagation; this observation quickly forced physicists to reject the concept of a special "ether" that may serve as medium of propagation and speed limitation factor. To postulate that the speed of light is a universal physical constant, being identical in any inertial frame of reference, was the logical conclusion of all these trials. Furthermore, the ideas that all reference systems are equivalent and the laws of physics are the same in all inertial reference frames (are invariant) were widely accepted. In other words, the speed of light does not depend on the speed of the source and any observer will measure the same value for this speed.

All these things seem to be correct in a profound relative world, where everything moves and an absolute reference point, to which we could relate the motion, cannot be pinpointed. From a certain inertial frame of reference, an observer will therefore see a "limited", "uniform" world, where nothing can have relative superluminal speeds. Based on these equivalence hypotheses, the Theory of Relativity (the special one) has automatically concluded that you can move through space and time at any speed - less or equal to the speed of light, but not simultaneously; therefore, space and time may be regarded as a single entity - called spacetime. Also, the local time becomes relative; it slows down once your speed approaches the speed of light.

Unfortunately, TR is not based on the fundamental mechanism of things; it builds, yet starting from concrete and correct observations and measurements, a mathematical model that is an imperfect reflection of the objective physical reality. The basic assumptions of TR were shaped in accordance with the measurements made in the "earthy universe"; then, the TR was simply extrapolated to the cosmic scale. All these adjustments and generalizations have created a partially accurate framework, distorting the natural perspective we should have on concepts like spacetime and matter.

Paradoxically, the concrete results we can obtain by applying TR are quite accurate. We can find a number of reasons leading to this, and among them are the *low speeds* of the planets in the solar system and the *low speeds* of the man-made vehicles and rockets (most observations being performed on Earth or inside the solar system). All tests and analyses should be extended, in principle, to more distant regions and to higher speeds.

3. The basic assumptions of TA

Obviously, it is very difficult to disprove all these assumptions that are backed up with a multitude of experimental data and all the good results that follow the TR calculations. However, could we imagine a wider framework which may allow better explanations of reality and where TR could be just a particular case? A new framework, complex enough to allow us absolutize the movement and eliminate, conceptually, the quasi-total relativization observed in all experiments made on Earth?

Einstein might have said once that the relativity is sufficient to fully explain the world and its physical laws, and to introduce an absolute frame of reference is an "unnecessary complication." In my humble opinion, this affirmation oversimplifies things, eluding some essential features of matter and of its dynamics.

A more complex framework, based on the granular model of space, was introduced in my first book [1]; it can better describe the movement of matter, at any scale, and redefines most of the fundamental physical quantities. This framework was later extended (see the book [2]) in order to include an essential element - the intrinsic absoluteness of our Universe, and this automatically led to some important changes in all TR's postulates.

This new theoretical construct started from a simple postulate about the constancy and absoluteness of the granular speed; this speed, denoted by ***C***, has been further considered a universal constant (as in [2] and [12], where AFR means the absolute frame of reference). Consequently, the speed of photons in a uniform granular medium is also constant and absolute (its value is only depending on the density of the spatial fluid).

Therefore, the postulate of TR that states the constancy of the speed of light in any IFR is not a universal truth, being in fact a particularization with old observational roots on Earth; it must be adapted and extended to the entire universe (see my new version in TA [2]) . Moreover, the laws of physics are the same in any IFR, but the proper states of all objects are changing with the absolute speed. These two postulates of TA are (in a simplified form):

- The speed of light is an *absolute speed* in this universe and, at the same time, an upper limit for the actual speed of any granular structure;

- The laws of physics are *the same* in all inertial frames of reference, but their parameters depend on the system's absolute speed and direction (in regard to an AFR).

The Theory of the Absolute [2] involves material objects in motion and specifies the way their absolute movement affects their internal states:

The proper state of a body in uniform motion can be fully and accurately determined only if its absolute velocity is known (as both magnitude and direction).

For example, the local time of an object will only depend on its absolute speed; obviously, it will differ from the local time of the other objects that travel at different speeds, but the difference between their rates of passage does not depend directly and exclusively on the relative speed.

4. TR and TA, explanations and implications

These two theories are apparently irreconcilable, although they both claim a constant speed of light in a vacuum; TR claims that the relative movement is sufficient to fully describe the local "physics" of a moving object, while TA says that we must know the absolute speed for a complete description. TR is thus limiting the perspective we may have on the surrounding "world" from an IFR, while TA enlarges and globalizes it. However, as the surrounding reality is something unique, we therefore may fully described it by a single, global and accurate model. The particular case in which these theories become mathematically compatible was previously shown in [2]; briefly, this case presumes that one of those two IFRs to move "relatively" with respect to an AFR and then to apply TR only on it. Thus, we may measure and obtain the same speed of value **c** for the light emitted in any direction. Considering this, could we embed TR into TA and continue to use the good results yielded by relativity, just changing the context where it applies? Anyway, we have to explain the real physical phenomena and to give some concrete examples before answering this question and drawing a well-informed conclusion.

Firstly, let's go back to our earthy lab and to its granular characteristics. Ever since my first model [1] was conceived, the granular fluid (the medium in which all material bodies, particles and photons are immersed) is thought to be a special fluid made of countless spatial granules that move with the absolute speed ***C*** (estimated to be at least **1.4 c**). At this level, the rules of a simple mechanics allowed us to identify the gravitational fluxes and to describe the movement of matter of any kind (with respect to the AFR - that universal, privileged, fixed frame of reference). But what happens on the Earth's surface? Is there something changed in this granular framework? If our laboratory has this absolute speed (about 400 km/s in AFR), then why don't we get different values for the speed of light on different directions (the measuring accuracy of 1:1000 now being accessible)? The short answer is yes, there is a change in this framework and it simply explains the identical values for speed.

As it was shown in one of my previous articles [3], the granular fluxes that flow near the surface and in the vicinity of big cosmic bodies undergo some substantial changes. These fluxes, no matter if they were reflected or if they have crossed a body, are "modulated" by the particles from inside that structure (we saw how the granules are reflected by particles - which are completely opaque to fluxes). As the constituent particles are continuously moving, vibrating and rotating, the quantum-scale modulation will vary accordingly. Certain regions of space around the cosmic body are thus crossed by fluctuating granular fluxes; the intensity of these continuous *fluctuations* is very low, much smaller than the global gravitational nonuniformity caused by the "opacity" of that body (as shown in Figure 1, where the flux fluctuations have different shades of gray in a two-dimensional representation). The intensity of the granular fluxes inside those squares varies in time, but its value oscillates around the local average level (which only changes with the distance to that body). The surface area of those shifting squares is comparable to the size of elementary and composite particles; this dimensional approximation is a simple deduction, as the particles themselves and their movements are the source of this phenomenon. All these changes of the granular fluxes (which also mean changes in the local granular density) allow us to state the general existence of random and continuous fluctuations at quantum scale in any area around a massive cosmic body, overlapping with the nonuniformity of the local gravitational field.

In other words, the spatial fluid of any region inside and around a cosmic body (planet, moon, star) undergoes a new kind of "granularization", now at the quantum scale. The intensity of this phenomenon, which will be named Quantum Gravitational Fluctuations - CGF, decreases with the square of the distance to that body. This new concept is similar to the *quantum fluctuation* of the modern physics (defined as a variation of the amount of energy in a "point in space"), but it does not involve the creation of pairs of virtual particles and does have a concrete dimensional attribute.

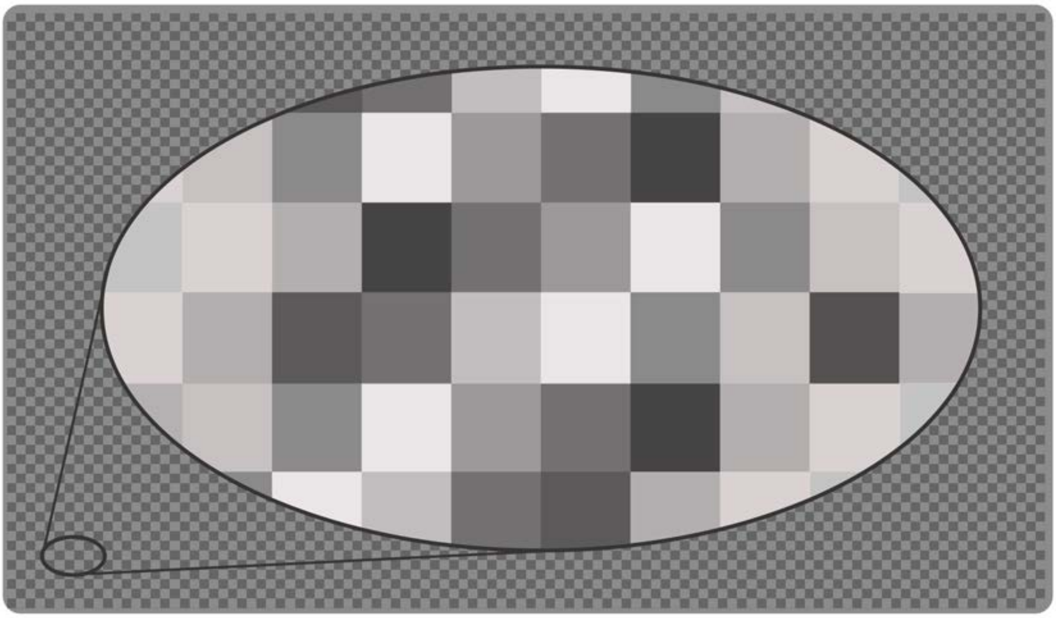

Figure 1 - *A two-dimensional detail of the granular fluctuations*

This new quantum granularization has another interesting feature, it accurately reproduces the global movement of the particles (and thus of the entire body) that generated it. For example, an observer from a space station orbiting the Earth may see how such fluctuations move synchronously with the rotation of the planet around its own axis, in the same direction. The effects of this new spatial granularization are very important, and they all are listed here.

Explanations

A) Let's imagine now a laboratory placed on an alien planet (an Earth-like one); this planet does not rotate around its axis, it just stands still in space (in regard to an AFR). Figure 2, the upper picture, shows the possible quantum granularity of a horizontal surface, a simplified picture that would be displayed by a hypothetical measuring instrument (in vacuum). Two photons, $\boldsymbol{\gamma_1}$ and $\boldsymbol{\gamma_2}$, are emitted by a light source in opposite directions and travel through this quantum granular medium (drawn with equal-size, black and white squares) at the same speed **c**. The granular density of this medium is considered uniform on any horizontal direction (we will further ignore the negligible effects of gravity on light).

B) Going back to our laboratory on Earth, we remember that it rotates along with the planet - its angular speed being **ω** and the peripheral one **v**; the measuring instrument should show the same distribution on a horizontal surface, as it moves simultaneously with the laboratory and the planet's gravitational field (we currently ignore the revolution and the global motion). Two photons emitted by a light source should have an absolute movement through space, traveling with speed **c** in opposite directions); each of them will practically "see" a different medium, a different quantum granularization. Figure 2, the middle picture, shows the structure of this new medium crossed by the two photons; the right side reveals a larger granularity, the photon and the medium having the same direction of travel and their relative speed being **c - v**. Things are reversed on the left side, where the relative speed should be **c + v**. Taking into consideration the formula of the speed of light in a granular medium ([5], Chapter 3), i.e. its variation with the granular density:

$$\mathbf{v_{light} = C / (1 + \rho\, \tau\, C)}$$

in conjunction with the apparent decrease and increase of density to the right and respectively to the left, we may easily realize why photons have undergone a real variation of speed and how they practically "changed" their absolute point "zero" in synchronicity with the global motion of their medium. Photons move in fact with the normal speed **c** on both directions, but with respect to a new AFR, namely the lab's IFR.

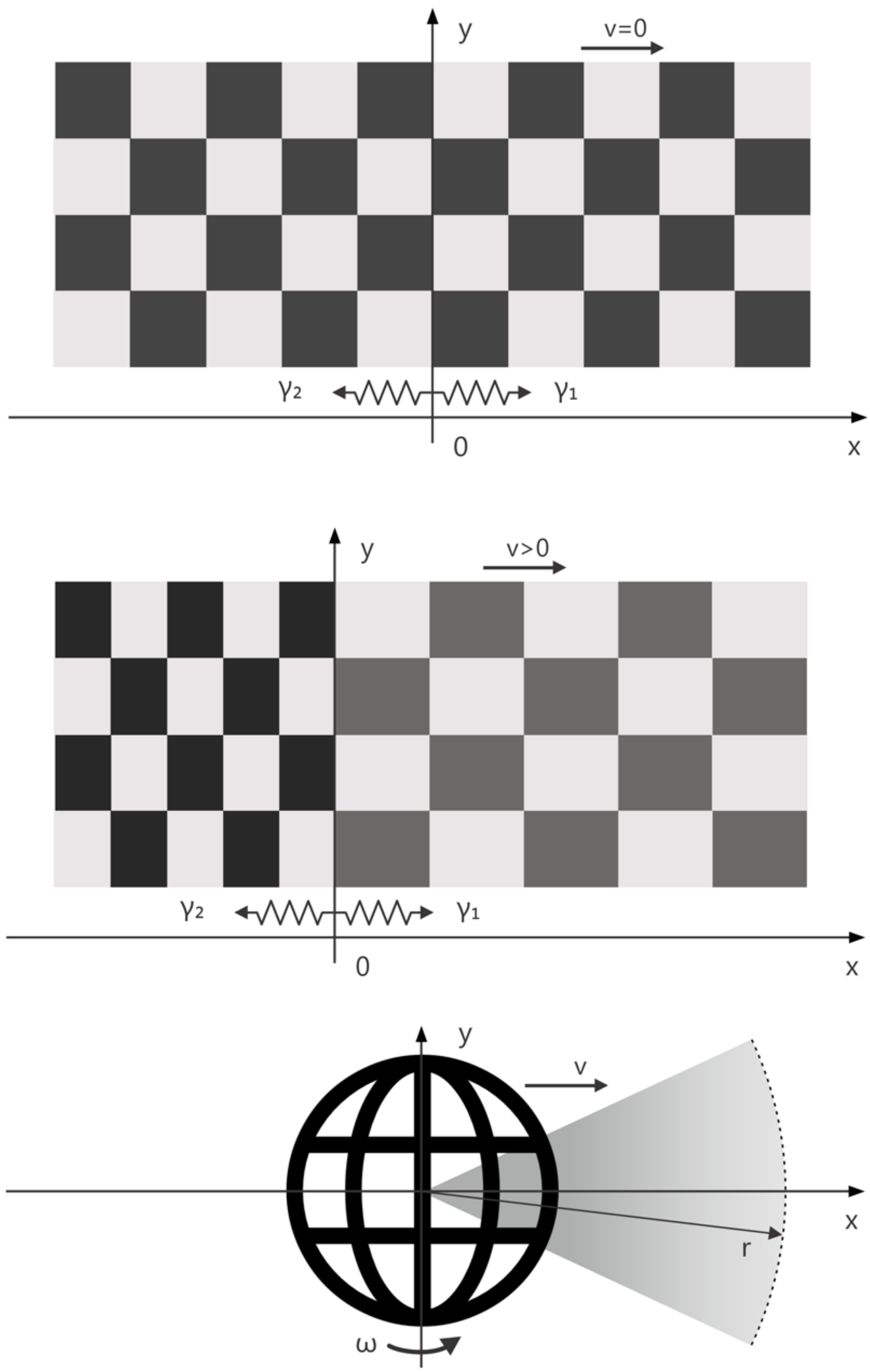

Figure 2 - *Quantum gravitational fluctuations in AFR and IFR*

What if those two photons were emitted on the OY axis, upwards and respectively downwards? Obviously, they will follow the new "straight path"; while moving along the axis at the normal speed **c**, both photons will be "dragged" to the right with the speed **v**. Their initial directions, presumed to be of absolute kind, are changed and adapted to the local IFR's velocity.

We are facing a significant change in the entire local physics, caused by the inherent "absolutization" produced in any IFR that moves synchronously (the same speed and direction) with the source of the gravitational field. The QGF phenomenon (which is in fact determined by gravity, i.e. by the presence of a massive body in space) becomes dominant in all regions where the gravitational field has significant strength - inside a sphere of maximum radius **r**, as in Figure 2, the lower picture. At this distance, the amplitude of these quantum fluctuations gets very small, reaching the normal level of the empty space. However, the gravitational fields and their fluctuations superpose in a point in space; thus, the most intense source will impose the physics in that place.

Implications

A) Experimental detection of that "ether", made by measuring the speed of light on various directions (Michelson-Morley type experiments), cannot have a positive outcome, even in a perfect vacuum. The QGF phenomenon occurs at granular level, changing the fundamental structure of space; it will affect any measurement, on any direction (inside that sphere of maximum radius). In order to succeed, this kind of experiments must be carried out in a distant place (far away from the gravitational fields). As an alternative, the light sources should move at significantly higher speeds with respect to the "local absolute".
B) This change of the local physics involves changes in the physical movements of particles and atoms; the entire dynamics of the quantum "world" is practically affected by the new "local absolute".
C) If we leave the Earth's sphere of influence, Sun would be the next major player in our solar system; farther away, the galaxy and its central black hole are also counting in this picture. However, the intergalactic space is in fact that cosmic region with no such quantum fluctuations.

D) It is obvious now that TR may be applied successfully in this local absolute frame. All postulates of special relativity are therefore valid in these systems with local gravitational fields and low absolute speeds, and the adjacent constructs (Lorenz transformations, Minkowski space, GTR and its formalism) are now making perfect sense.

E) What is the absolute speed one massive body may have, so that the QGF phenomenon would still cause the absolutization of the local physics as described? The answer depends on the exact value of granular speed ***C****;* if we consider $\boldsymbol{C} \cong \mathbf{1.4\ c}$ (as in [1]), we can estimate the value of that maximum speed to $\boldsymbol{C}$ **-** $\mathbf{c} = \mathbf{0.4\ c}$. This quantum phenomenon is thus present in most cosmic systems (including Earth, with its absolute speed of about 400 km/s).

F) Does the local time of these systems differ from the Universe's absolute one, of maximum rate? Yes, time is dilating in these systems, all their components move at a certain global speed that produces changes to the granular impulses of particles. Therefore, the temporal comparisons made in [2], Chapter 3.4, are all valid; we have to pay more attention when we leave the relative zone of a gravitational field and apply TA instead. The rates of time must be compared by using TR inside of a system and by using TA between different systems or places.

G) Let's now consider an ideal system, free of gravity (for example a spaceship crossing the intergalactic space), where we would like to measure the local time. A light clock will be used to that purpose (like the one described in [11], Chapter 6); all TA conditions are fulfilled and the absolute speed of the ship, **v**, is known. With respect to the local IFR, the absolute speed of light (denoted by **u**) may have different values, as in this formula:

$$\mathbf{u} = \sqrt{\mathbf{c}^2 - 2\,\mathbf{c}\,\mathbf{v}\cos\boldsymbol{\alpha} + \mathbf{v}^2}$$

(**α** being the angle made by photons with the ship's direction of travel).

If this clock would use omnidirectional light pulses, the time dilation factor is slightly smaller than the TR's one, according to this formula (numerically tested):

$$\Delta t' / \Delta t = 1/\pi \int_0^{\pi} \frac{c}{\sqrt{c^2 - 2\,c\,v\,\cos x + v^2}}\, dx$$

The definite integral was made over a semicircle interval due to the obvious spatial symmetry. Replacing v/c = β, it yields:

$$\Delta t' / \Delta t = 1/\pi \int_0^{\pi} \frac{1}{\sqrt{1 - 2\,\beta\,\cos x + \beta^2}}\, dx$$

5. Conclusion

In my opinion, this article might help solving the most important incompatibility or inconsistency of the modern physics: on the one hand, the absolute spatial medium and its special mechanics (described in [1] and [2]); on the other hand, the Theory of Relativity. My explanation is based on the particular change caused to the granular space by the presence of massive bodies, i.e. of the gravity. This new phenomenon has been named CGF and it is in fact the consequence of an additional granularization of space, one that is imposed by the presence of a structure with numerous particles (atoms and molecules). Consequently, all of the local granular fluxes are affected, being modulated and combined at quantum scale by the interactions with the dense matter; in fact, a matrix with the instantaneous distribution of that matter is superimposed over the uniformity of the local fluxes. A significant cosmic mass will thus "mark its territory", changing the very fabric of the surrounding space and leaving a trace of its global movement. We may say now that the gravity influences the entity called local spacetime on two planes; moreover, it has a direct action on matter and absolutizes its dynamics. Theory of Relativity may thus be applicable in any local context, but only if we identify the local absolute system. In case of global situations or of zero gravity, we should use instead the Theory of the Absolute. Consequently, our Universe proves to be a large collection of local absolutes, of small universes that are more or less overlapped. Each significant cosmic body and formation disturbs the uniformity of the granular fluxes, also their pattern; this affects the movement of matter around these bodies, starting from the quantum level.

Abbreviations and Acronyms

CMB - The Cosmic Microwave Background
Big Bang - A theory on the universe's birth
"Abc" - Figurative language
QGF - Quantum Gravitational Fluctuations
AFR - Absolute Frame of Reference
FR - Frame of Reference
IFR - Inertial Frame of Reference
SR - System of Reference
TR - Theory of Relativity
GTR - General Theory of Relativity
TA - Theory of the Absolute
PT - Prime Theory

6. References

[1] Laurentiu Mihaescu, 2014. *Prime Theory*, Premius Publishing House

[2] Laurentiu Mihaescu, 2015. *The Universe*, Premius Publishing House

[3] Laurentiu Mihaescu, 2016. *The theory of granular gravitation*, article

[4] Application "*Particle Simulation*", Microsys Com, 2015, www.1theory.com/software.htm

[5] Laurentiu Mihaescu, 2016, *The First Bangs*, article

[6] Application "*Elementary Particles*", Microsys Com, 2017, www.1theory.com/software.htm

[7] Laurentiu Mihaescu, 2017, *The formation of elementary particles*, article

[8] Laurentiu Mihaescu, 2017, *The shape of elementary particles*, article

[9] Laurentiu Mihaescu, 2017, *Mass-energy equivalence*, article

[10] Laurențiu Mihăescu, 2017, *Granular collisions*, article

[11] Laurențiu Mihăescu, 2017, *Time and relativity*, article

[12] Laurențiu Mihăescu, 2018, *Fundamental constants*, article

[13] Alan Guth, *Was Cosmic Inflation The 'Bang' Of The Big Bang?,* 1997

[14] Laurențiu Mihăescu, 2018, *The size of our Universe*, article