

## Version

### **The concept of time and its connection with the physical vacuum. Description of the physical processes originating from the movement of time.**

#### Abstract

Physicists, experimenting with actual materials, create a mathematical model for the results. The method has successfully operated for centuries. At present, this method is excessively formalized, removing physics from cause-effect relationships. Avoidance of cause-effect relationships often leads to incorrect models. The causes of the appearance of "nebulae" are often shown as a narrow review of the problem. For a complete review, it is necessary to remove and expand the existing framework. This process led cosmologists to offer "dark" energy and matter, to explain the recorded increase in "red shift" bias.

To solve the problem of "nebulae" and also certain contradictions in physics, we will turn the procedure the other way around. In this paper a mathematical model of the general processes of the universe is proposed. Known facts are compared with the model (this is how investigators work; calling the model a "version"). The basis for the model is the motion of time, which is one of the reference points of the universe. Modern physics does not contain a "theory of time". Time in physical theories is used in a paradoxical manner: Either, "time is taken into account" or, "there is no time". In the theory of relativity, time is secondary and is associated with space. In the theory of quantum gravity and superstrings, the concept of time is incorporated but without clarifying its essence. For example, the works of N.A. Kozyrev on the connection of time and energy are not used. There is a need to define the concept of time as one of the foundations of the universe.

If time is abstract, then it cannot in any way affect real phenomena in nature - mass, volume and energy and vice versa: Mass cannot influence abstract time, its passing, etc. The conclusion is drawn that time is a moving moment of "now"; in essence, a period of transformation of the future into the past. The movement of time creates a series of processes in Nature.

Transformation manifests itself as a continuously moving and stable passage of time which creates the processes. In this paper, an explanation is given for the changing "red shift" of the stars which does not incorporate the presence of "dark" matter or energy.

#### Introduction

The development of physics led to its division into independent disciplines. This further led to the emergence of new areas of research. Their development requires expanding the scope of currently existing theories of physics, since the framework of the various sections is determined by the limitations of the physical laws corresponding to them. For their expansion, it is necessary to put forward theories and hypotheses. [1-3], which will contribute, not only to solving problems, but also to the emergence of contradictions. The unity of real Nature requires the connection of these disciplines through finding a unifying factor.

What unites all processes in the universe? In quantum mechanics, string theory is trying to give the answer [4]. Classical mechanics is not the answer, but two indirect answers exist. The first is the existence of unknown components, which unite all. Cosmologists came to the conclusion that 95% of nature exists in a "dark" manifestation. The second answer is known to everyone. We do not see and do not feel the natural habit of breathing; the presence of air is determined by resistance when inhaling, the appearance of odors in it, or in the absence of air. What is common in physical nature? Here are two answers: physical Space and Time.

The increase in the number of disputed (controversial) theories and hypotheses indicates the departure of physics from knowledge of the reciprocal connection in existence. To unite all, the "unity of independent systems" must be observed. This is realized in the combination of independent characteristics: "Electron particle and wave" unity is described by duality. To be a particle and a wave is to "intersect" with properties. A common and convenient mathematical intersection is created by intersection along the normal.

The opposites are striving to unite. By creating a single system, opposites mutually neutralize each other. Opposites are qualified as duality. Consequently, there are two variants of the mathematical description of duality. Let's define the terms. The variant describing the interaction of opposites, we name duality. The variant of interaction of independent systems along the normal, we denote by the term complexness (from complex numbers).

### Geometric analysis

In a rectangular coordinate system, the duality corresponds to the line:  $(x + y) = const$ . The complex number  $i$  corresponds to the rotation by  $90^\circ$ . Two turns of  $90^\circ$  create a sign (-) for the process. The transformation of the sign (+) into the sign (-) creates the unity of the dual pair. Therefore, for the unity of opposites, there must be the possibility of transforming each part of the dual pair into a complex state. Complexity from the line creates an area and mathematically has the form  $(-x)(y) = (-y)(x) = const$  or  $xy = (-x)(-y) = const$ , i.e. algebraic equality, in different quadrants of a rectangular coordinate system.

Unity, in the presence of contradictions, is called a paradox. From the algebraic equations of complexity and duality, it follows that for the emergence of the paradox it is necessary to ignore a certain reality, that is, a sign or component. Modern science recognizes all the realities of Nature. Consequently, it ignores reality conditionally. To recognize that, it is to know that "This" is, and "This" is an illusion. Of the existing realities of Nature we refer to the understanding of time.

Time, as a gap between events, is recognized by all. Time, like physical reality (analogous to mass, volume and energy), is almost unperceived. The word "almost" arose because of the recognition of a change in the pace of time. "Nothing" cannot move and change the pace of movement. In addition to the relational-static concept of time in the theory of relativity, the properties of physical, biological, chemical, psychological, geological, social, historical, cultural and other forms of time are explored. Interest in substantive concepts) remains there [5]. through the combining of the tangible and time. The question of the reality of time can be solved in this manner.

The unity of matter and time is achieved in the equations describing the energy of moving bodies - when the bodies move, the rate of time changes. We will perform a number of mathematical operations. In the inertial reference frame, the deceleration of the time tempo is considered relative to one coordinate axis. For a moving body, the following equations are respected:

$$l = l_0 \sqrt{1 - \frac{v^2}{C^2}}, \quad t = t_0 \sqrt{1 - \frac{v^2}{C^2}}$$

$l$  – linear size of the body at speed , along the motion vector.

$t$  – the tempo of body time at speed

$l_0$  – linear body size at rest

$t_0$  – body time at rest

Let's divide the right and left sides of the equations into each other.  $\frac{l_0}{t_0} = \frac{l}{t} = k$  or  $l=kt$ ,

$k$  is a proportionality coefficient that describes the mutual dependence of the linear size and the tempo of the body, independent of speed and reference frames. In the special theory of

relativity, the coefficient  $k$  is the Lorentz invariance of the four-dimensional volume element.

Using the independence of the proportionality coefficient  $k$  on velocity and reference frames, we consider the rectilinear motion of the ball.

For  $l = kt$ , the energy of a moving body is described by equation

$$E = \frac{l_0 M_0 C^2}{l} = \frac{3V_0 M_0 C^2}{4\pi l l_0^2} = \frac{3V_0 M_0 C^2}{4k^3 \pi t t_0^2} \quad \text{where}$$

$V_0 = 4\pi l_0^3/3$  - body volume at rest

$M_0$  - body weight at rest

$E$  – kinetic energy of the body

At rest the equation takes the following form.

$$E_0 = \frac{3V_0 M_0 C^2}{4k^3 \pi t_0^3} = \frac{V_0 M_0 C^2}{k^3 T_0} \quad (1)$$

$T_0 = 4\pi t_0^3/3$  – body volume time

At this stage, I ask the reader to verify the dimensionality of equation (1).

My View:  $\text{m}^3 \times \text{kg} \times (\text{m}^2/\text{sec}^2)/(\text{m}^3/\text{sec}^3) \times \text{sec}^3 = \text{kg} \times \text{m}^2/\text{sec}^2$

In the equation, the time value appeared as a volume value. Removing long reasoning (the pace implies a wave function), I'll turn to logic. For a voluminous world to move and exist in time, time must be voluminous.

We shall carry out a mathematical analysis of equation (1). Mathematical analysis of an equation consisting of several variables can be carried out jointly and for each variable equation separately. In mathematics, this is the norm. In physics, compliance with dimensions is required. A formal approach to the mathematical analysis of equation (1) will create a formal dimensional disruption—a description of the change in the amount of energy, the variation of the various variables of the equation: the mass, volume, and tempo of the body in question. When the variables are equal, with respect to the change in energy, equality of dimensions arises, relative to the energy. Taking the other variable of equation (1) as the basis of the equation, we obtain equality of dimensions relative to the other main component. From this it follows that all dimensions are formally equal. I found the conclusion earlier. Moreover, calculations were made in [6] on numerical values and limits in the relations between physical characteristics. In our case, the physical characteristics of the body are the variables in equation (1).

Taking into account the formalities of dimensions in mathematical analysis, to simplify the description of the analysis of the equation, we derive from the equation constant values: the coefficient of proportionality  $k$  and the speed of light. The derivation from the formula of the coefficient of proportionality  $k$  and the square of the speed of light disrupts the dimensionality, transforming the equation into a relation without changing the essence of the results of

mathematical analysis.

The ratio allows us to conditionally take it for equality.

The relationship takes the following form:

$$E_0 = M_0 V_0 / T_0 \quad \text{или} \quad E_0 T_0 = M_0 V_0$$

In motion, when all the characteristics of the material body undergo changes, the co-relation takes the form:  $E = MV / T$  or  $ET = MV$  (2)

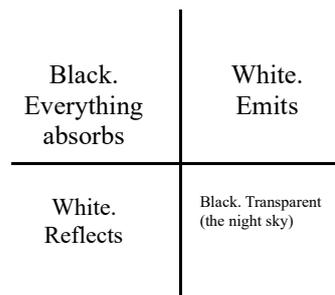
Relation (2) shows that the mass, volume, and time of the body are integral parts of the energy of the body, with the inseparable connection of matter and time. In reality, matter always has mass and volume, therefore, the product  $MV$  mathematically describes matter. When describing matter with the formula  $MV$ , the indicator  $V$  indicates the form of matter and the specific size of this form. At the same time, there is a physical vacuum in nature, in which matter is present and natural processes are realized. The physical vacuum, without a specific shape and size, has all the properties of volume. If in nature there is an independent volume without form, then independently there exists another part of the formula describing matter, mass  $M$  or "black hole". "Black holes" can be called a type of matter that does not have volume or mass.

When  $MV = const$  "black holes" and space become the extreme points of the equation describing the material world, matter will be the middle point of the equation. In this case, the analysis of the properties and behavior of matter allows us to evaluate the properties of "black holes" and space. To exclude the influence of external factors, the volume of matter, the volume of chemical elements, we take the volume of nuclei.

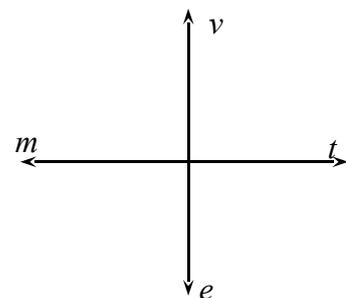
If matter, mass, form of matter, time and energy exist in nature, what is  $TE$ ? If  $TE$  exists in reality, then we should meet with it. The first answer is that  $TE$  exists only in matter and is inextricably linked with matter. In other words, the properties of matter are a property of a single system. If matter is a single system consisting of two components, then this double system should break up into its component parts. The question "What is  $TE$ ?" arises again.

To answer this question, consider the dual pair "black - white". In nature, this pair exists in the following species. Black color has a body that absorbs all the photons falling on it and a physical vacuum that passes through any radiation. White color can be a consequence of radiation or reflection. Let's imagine the variants of black and white color scheme (Fig. 1). Diagonal pairs "white-white" and "black-black" are obtained, which are not a copy of each other and at the same time are not dual.

Taking as a basis a rectangular coordinate system, we represent matter as the product of two vectors located along the normal to each other. This work creates a quadrant. Similarly, we can represent the product  $ET$ . The kinetic energy of matter is described by an equation indicating the unity in matter of all four components. Unity is possible if quadrants have a common point. By connecting the quadrants, we obtain a diagram (Fig. 2).



(Fig. 1)



(Fig. 2).

The equation  $ET=MV$  describes the duality of the unified system. Based on the duality of matter and  $TE$ , we define the properties of  $TE$  based on the properties of matter.

With a sufficiently large layer, matter absorbs photons. What happens when a large layer is transparent to electromagnetic radiation? Matter has a concrete form, therefore, the  $TE$  does not have a specific form. Of the phenomena known in nature, the physical vacuum has these qualities. It is customary to call a vacuum a vacuum, having the property of being a "medium" and a place, for processes in Nature. Emptiness is necessary for the motion of bodies and photons. "Environment" is needed for the existence of fields and wave motion. We will divide by properties "environment" and Emptiness. Emptiness cannot be a medium. Consequently, the physical vacuum, the properties of the "environment" is attached to the presence in it of the component  $TE$ . We will give the name "Ether".

What are the properties of the Ether components? Component  $E$  (absolute energy) occurs when there is no tempo of time. The tempo of time is absent when the time movement stops. Stopping the movement of time occurs when moving at the speed of light. With the speed of light, photons move in a physical vacuum. Consequently, the absolute energy particles are photons. Component  $T$  occurs when the Ether has no energy. There is no energy in physical Space. For material particles, there is no energy at an absolute minimum of temperature. For kinetic energy, the absence of energy, arises at rest. Consequently, the component  $T$ , is one with the absolute minimum of the temperature, the state of rest and the space. How is Time related to Space? For the answer, we continue the geometric analysis.

The scheme (Fig 2) indicates the possibility of the existence of  $TV$  and  $ME$  formations, but in nature they were not detected. Therefore, the presented scheme distorts the true state of things. To clarify the scheme, let us return to the fact that matter ( $MV$ ) and physical vacuum ( $TE$ ) are independent quadrants. The quadrant is essentially a plane. If matter and physical vacuum were dual to each other, the quadrants would be parallel and have transitional states. The option remains to arrange the planes along the normal to each other - complex. Two planes along the normals to each other make it possible to create a three-dimensional world. The circuit takes on the following form (Fig 3).

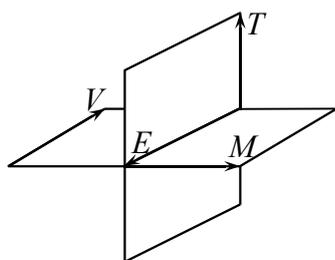


Fig 3

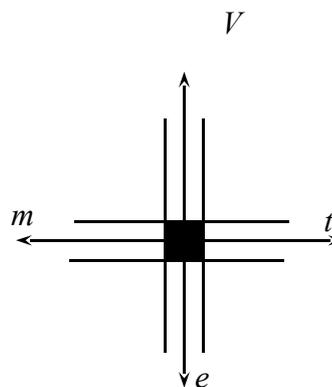


Fig. 4

Consider the plane  $MV$  in Fig. 3. The plane of matter has a common straight line of intersection with the plane of physical vacuum in the form of kinetic energy. Consequently, matter is able to change its energy and, in conjunction with energy, move in time. On the plane describing the matter, the kinetic energy can be represented by a vector or a point. In the form of a vector, the kinetic energy indicates the direction of motion. The kinetic energy in the form of a point characterizes the temperature of the system.

The next conclusion from Fig. 3 is that in matter, "black holes" and space, time is a physical point. Time, in the form of a physical point, is the same in all space. And vice versa. In time, space is a physical point. Conclusion. In the universe there is practically no difference in time,

regardless of the place of measurement. This fact allows the existence of a "red shift" of radiation in space. In time, there must be an "expansion effect of space, relative to the past size." I do not know how to register this effect.

The presence of time tempo indicates the existence of some standard time dimension. The standard time value will be called the moment "now".  
outside the  $MV$  plane, time, in the form of a "time arrow", sets the direction of motion of the moment "now". The direction of the movement of the moment "now" determines the past and the future.

According to (Fig. 3), material exists only in the moment "now". In the future and the past, there is no matter. This means that the material moves together with the moment "now", as passengers in transport (time). This statement is enough to put a cross, instead of a dot. Before putting a cross on the version. Let's pay attention to the fact that the future and the past are different physical states of time. To change the state, a transformation process is required, between the initial and final states. Consequently, in the moment "now", the transformation of the future into the past or the moment "now" is going on, there is a period of transformation of the future into the past. Here there are questions. Transformation is, where is the transformer? Where is the future? Where is the past stored? More information about the transformation and its effects in the following articles. At this level of analysis, suppose that our world is that "hole" through which the future flows into the past. The period of transformation is the moment "this hour" - the time in which we live. We got a known situation: nature exists, and time flows through nature, preserving nature in the moment of transformation - the moment "now". Conclusion. Separation of the past, the future and the moment of the "now" investigation, the moment "now" is a period of transformation of the future into the past. The period of transformation is one and therefore the moment "now" in the singular. Periods of transformation have a certain duration. The moment "now" is capable to change, at change of conditions in the external world. The change in the value of the transformation period is recorded as "acceleration" or "slowing down" the tempo of time. Slowing down the tempo of time reduces the speed of the transformation of the future into the past.

The union of the periods of transformation creates an abstract sum of periods, so a duration of the event arises. The inability of the periods of transformation to create a real sum, deprives us of the opportunity to move in the sum of periods, i.e. to visit the past. A journey into the future, even as an abstract possibility does not exist. In physical nature, the reference point has a volume, and the area (Figure 4) or the main components of nature are combined by specific ranges. This creates a "mutual presence" of all components at the physical point of nature. The presence of a volume midpoint / sphere, between the basic phenomena of nature, allows for a transformation between these phenomena in nature. The corridor, between the basic phenomena of nature, allows to create continuity: forms, movements in space, existence in time.

Why can you go back to the same point in space and you can not return to the same point in time? The answer gives the complexity of the properties of time and physical space. Physical space has a volume and does not have a specific shape. Time "is mutual" in the physical space and, consequently, also has no specific form. What difference can there be between two volumes without form? Only in the form of a pair of "how-to-move." We have: A physical space is a place that allows you to be present and move around everything that is in it. Physical time moves itself and allows it to be in it only at the moment "now". Moving, inside the moving system, allows you to accelerate and slow down the speed of your movement, relative to the reference system.

Why is there no time acceleration effect found in nature? The mode of time movement differs from linear and rotational motion. Time moves in the physical space, expanding or contracting, i.e. time is volumetric [7-9]. With this motion, the proportion of proportions in the sphere always remains, as its dimensions change. Any point inside the ball can be the reference point of the standard time. The material body, moving in any direction, will always create the resulting tempo of time from its own time and movement of time from the expansion or contraction of the time ball. If the balloon of time is compressed, the resulting value will indicate the acceleration of the

time course. If the time ball expands, the resultant always and in all directions will show a slowing down of time. But time is "dissolved" in space, therefore, it is not a question of compressing / expanding time, but of increasing / decreasing the time concentration in the universe. In nature, only the effect of slowing down the tempo of time is known, therefore, the concentration of time in the universe is reduced. The process of reducing the concentration of time is possible in two ways. Transforming time into "something" (turning the future into a past), or increasing / expanding physical space. In reality, there are all components, the proportions are different.

Consider the graphical interaction of the components of equation (1). Vectors can form a sum, which is the resultant vector  $R$  and the product, in the form of the surface area. All interactions can be described on the plane (Fig 5).

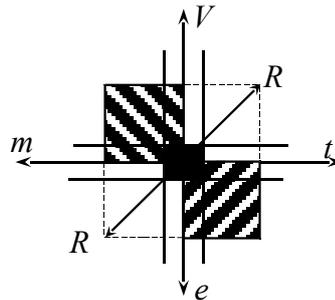


Fig 5

In Figure 5, matter ( $MV$ ) and physical vacuum ( $TE$ ) are described as areas (products of vectors). The pairs ( $T, V$ ), ( $M, E$ ) are the sum of the vectors indicating the ratio of the components  $V, T$  and  $M, E$  at  $R^2 = a^2 + b^2$ .

Example: Mass and kinetic energy are mutually present in each other, but do not form an interdependent unified system. This allows us to change the mutual ratio of the components in the "kinetic energy-mass" pair. Time "now" and physical space, are mutually present in each other. The presence of a mathematical description of the pair ( $T, V$ ) makes it possible to consider the mutual presence as a whole. This was the basis for the emergence of the concept of SpaceTime, as a single substance. In reality, SpaceTime is united in the moment "now" and when the Space is tightened to the point. Outside of unity, SpaceTime is a mixture, similar to wet sugar, to tea without sugar. The volume is one and inseparable, and the components have different properties. Corridor, the mutual presence, between the basic phenomena of nature (Fig 4) and the  $TE$  vector, creates support for the supporters of the STR. Going beyond the "black square" and into another quadrant, creates a support for opponents of the STR.

The possibility of a mathematical description of the pair ( $M, E$ ) creates an opinion on the analogy of mass and energy. Mix the discrete mass and a specific type of energy into a single, does not allow the actual situation. As a result, the mutual presence of mass and energy began to be described by extreme known points. The point of maximum energy, in the absence of rest mass, has the form  $E=MC^2$ . The point for the rest mass, with a minimum of energy, is energy at absolute zero temperature. (Consequently, the energy of the electrons in the atom, which is at absolute zero, is the natural minimum of the energy of matter).

The reliance of physics on  $TV$  and  $ME$  pairs, creates a relationship to the consideration of variants of  $TE$  and  $MV$ , as options describing "not physics" or simply not understood by physicists. The absence of environmental protection, when describing the interaction of pairs  $TV$  and  $ME$ , creates an ignorance of cause-effect relationships. The violation of cause-effect relationships is compensated by the expansion of mathematical models. Pulling out theories and hypotheses, based on the limited perception of physical nature, it is difficult to create harmony in physics. To create harmony, new hypotheses and theories are beginning to be put forward, to

which additional mathematical models are created. As a result, physics becomes "not physics," but mathematics can not be called it. The ability to consider registered actual materials, from their vector, creates room for the emergence of theories and hypotheses that describe the "point" states of the common system. In the absence of cause-effect relationships, a point on the line can be approached from two sides. So there are paradoxes.

Looking ahead, I inform you that the formulas  $dM$ ,  $dV$  and  $dMdV$ , are realized as a description of magnetic, electrical and electromagnetic properties. Consequently, ignoring the complexity, creates contradictions among the supporters of SpaceTime, with representatives of the electromagnetic direction in physics. Ignoring the existence of the ether ( $TE$ ), creates a negation of time, as a physical real phenomenon and difficulty in explaining the dependence of the "red" bias, on the duration of the signal on the way. It is known that ignoring the existing part and properties of the system leads to the growth of contradictions and generation of exclusivity of their views and theories - this is the practice of different spheres of life.

### Mathematical analysis of the model

To carry out the analysis it is necessary to have an equation. We have already considered the relation  $TV/ME = const$ . Conditionally, we take the relation for the equality  $TV = ME$ .

1. For the ratio (2), external influences or internal causes create dynamics. In a dynamic nature, the right and left sides of the relationship interact, creating a change (defect) in the magnitude of the component. In equation (2), the components are physical phenomena of nature: mass ( $M$ ), energy ( $E$ ), time ( $T$ ) and volume ( $V$ ). The components are real, so let's call them the Phenomenon of Nature.

When  $MV=TE=const$  a defect arises in any Phenomenon of Nature, a reaction of counteraction is created in another Phenomena of Nature. The reaction is aimed at reducing the primary defect and maintaining the stability of the remaining parts of the unified system. The stability of one variable creates the stability of the second variable. Stability of the mass creates stability to the volume. The stability of matter creates the stability of Ether and vice versa. For the stability of the 3 Phenomena of Nature, when changes occur in one, two defects of different signs appear in it - **this is how the phenomenon of physical duality arises**.

The sum of the dual defects is zero. The defect can not exceed the magnitude of the Phenomenon of Nature. This requirement limits the effect created by defects in the Phenomena of Nature.

2. Change in the energy of the material system with a defect in the tempo of time in the system.
- 3.

$$-dEt = \frac{M_0 V_0 T}{T_0} \times \left( \frac{dT}{T_0} \right) \quad (3)$$

$dE_t$  – change in the energy of the material system with a time defect "now" in the system

$dT$ – time defect "now" in the system

$1/T_0$ - duration of the natural time period "now"

The quantity  $1 / T_0$  characterizes the duration of the "now" time period. The measured amount of time consists of the sum of a set of periods  $1/T_0$  or  $M_0 V_0 / T_0$  describing the finding of matter in a time period of standard size.

$M_0 V_0 / T_0$  - finding matter in the time period "now".

$dT/T$  - change in the tempo of time (the "now" moment) in time.

The tempo of time is slowed down, giving matter velocity (kinetic energy). With the reverse process, there is an acceleration of the tempo of time, which must be accompanied by the release of kinetic energy. Chaotic kinetic energy is thermal (electromagnetic) energy. Consequently, the acceleration of the tempo of time creates the process of radiation by the matter of electromagnetic energy.

The movement of time in time (the moment "now" from the future into the past) is an analogue of the acceleration of the tempo of time. In this case, due to the movement of the moment "now" in time (from the future into the past), massive material bodies emit electromagnetic energy, while the less massive ones have a heated or molten core inside. At the Earth the core is melted, Saturn and Jupiter radiate into the energy space more than they receive from the Sun [10]. The sun and stars radiate electromagnetic energy. From the relation (3) it follows that the amount of energy, when the matter moves in time, is equal to the product of the mass by the total volume of the nuclei of the chemical elements of matter. The volume is proportional to the mass. Consequently, the energy released by the stars, when the matter moves in time, is proportional to the square of the mass of the star or the specific energy release by the stars is proportional to the mass of the stars. The increase in the density of atomic nuclei, with depth in the star, is insignificant. This creates a practically uniform specific release of energy, matter of stars. The rise in temperature will create the possibility of triggering a thermonuclear reaction in the center of the star. In this case, the release of energy from the motion of matter in time will remain. What part of the energy radiated by the star belongs to energy from the motion of the star in time? Consider.

The uniformity of energy release is not capable of creating a large temperature gradient, between the surface and the center of the star. If there are no thermonuclear temperatures in the center of the star, then all the energy radiated by the star is the energy released by the star from motion in time. And vice versa. In the presence of thermonuclear temperatures in the center of the star, the separation of energy from the star, from motion in time, is insignificant and served as a match for "ignition" of the thermonuclear reaction. The effect of electrons and chemical composition, on the intensity of radiation, on the motion of time, will be considered during the continuation.

The recorded effect of the "red" photon shift is considered a sign of the expansion of the universe [11]. But! In relation (3) it is shown that the size of the moment "now" (rate) is continuously changing and depends on its size at the previous moment. In the former photon, the "size" of the present moment "now" is fixed. Acceleration of the tempo of the moment "now" creates a reduction in the size of the moment "now" in the future. Reducing the size of the moment "now" in the future, creates the conditions when a photon that has arisen in the past has a "red" shift of the spectrum, relative to the photon of the "now" that has arisen. From this it follows that the recorded expansion rate of the Universe is overestimated.

With the movement of time, the rate of time in the future, with respect to the "now" moment, is described by equation

$$T_f = T_0(F - xt) / (P + xt),$$

where  $F$  is the future,  $P$  is the past.

$t$  is the duration of the event.

This equation shows that the recorded "red" displacement, from the motion of the moment "now" from the Future to the Past, should grow not only with acceleration, but also **with accelerating acceleration** (!). The growth of the "red" displacement with acceleration is already fixed. It was necessary to fix the acceleration of the acceleration of the "red" shift of the spectrum. Consequently, taking into account the effect of changing the frequency of radiation, in the natural course of time, reduces the need for the presence in nature of "dark" matter and energy.

Space is a point on the arrow of time, i.e. The space, with the filling, is in the moment "now". As a consequence, the speed of time propagation in the "point" of physical space is enormous relative to the dimensions of physical space. Such a speed of time movement in physical space creates synchronization of time "now" in physical space.

### **Physical Emptiness**

First, let's define with the need to enter the term Physical void, i.e. for example, why the concept of "physical vacuum" is not enough. The reason lies in the dichotomy (this is not it) of mathematics. The limitation of mathematics to dichotomy creates a situation of duality in the concept of Emptiness. Geometric emptiness implies the absolute, i.e. const. Const, taken as a reference point, becomes an absolute zero. Real emptiness (in the crowd there is no right person) is a concrete, but not taken into account completeness. This section will deal with a real emptiness. The appearance of a real emptiness occurs when the sum of the registered properties is zeroed or the component is removed. On the line, the sum of the dual components becomes empty. Invariance of the sum creates a mutual dependence in the form of positive feedback (PFB), creating the possibility of the existence of infinity and zero. The possibility of the existence of infinity makes an open system with PFB.

In a closed system, deleting a component is possible only by transforming one component into another. In this variant, the unity of a point and infinity can be mathematically described as a negative feedback - OOS. The presence of a NFB creates a Void of infinity and point size constraints. NFB violates the dichotomy of mathematics. To the pair "this is not this", the possibility of the existence of at least one normal is added, i.e. we are talking about trichotomy and even about polychotomy.

According to Noether's theorem, there must be a continuously varying component for the stability of the Void. A continuous change is created by movement. The emptiness itself can not move. Consequently, the void has conditions for the realization of the movement or is the place of transformation. Transformation creates a continuous movement that gives stability to the Void. In this case, the Void and Transformation, the interdependent phenomena or the rate of transformation determine the size of the transformation site. The sizes are regulated by the existing constants. Conclusion. Mutual compensation in the pair "peace-movement", indicates that the limited speed of light, limits the size of infinity.

### **Continuity and conservation laws**

Being an intermediary for transformation, emptiness, from the passive scene, becomes an active participant in processes - space. But what about the infinity of physical Space? On the plane, the property of infinity has a closed curve, ideally a circle. A line is the continuity of a point. Consequently, the continuity of the point creates an infinity of the line. Continuity of the line creates a sphere - an analog of the infinite-plane. Continuity of the sphere creates a ball - an analog of the infinite volume. Continuity of volume, creates a subsequent infinity. What is the subsequent infinity? For the answer, take a step back. The point acquires the property of infinity, with the continuity of the void, i.e. transformation. Point is the limit of the material world. Let's see, what's behind it? For the continuity of the void, it is necessary to have continuity of the next mark. Variants of development. The first is the realization of duality, in the form of the existence of an anti-world. Particles of the anti-world are known, but the anti-world is not found. Therefore, the option will be left in question, referring to the philosophy of Yin and Yang - there is a black point in our world, but we do not have a black world. The second variant is described by completeness. Complexity creates negative feedback of components among themselves. Mutual dependence creates continuity and limits in processes. The third option combines the first and

second. Dual-complex to space, a phenomenon that has a characteristic of "continuous not emptiness", i.e., the phenomenon is volume and moves in physical space. This characteristic corresponds to Time. For infinity of volumetric Time, one must have the continuity of flat Time, then the continuity of the "arrow" of Time and the "point" of Time. The Point of Time is the moment "now" - the time period in which the Universe exists. For the infinity of the moment "now" it is necessary to have continuity of the dual-complex Time. Dual-complex Time Physical Space. There was a cycle of the environment for transformation. Figuratively this cycle looks like two successively contacted sockets. There is a contact of the point of one Phenomenon of Nature, with the infinite volume of another Nature Phenomenon.

For our Universe, the transformation of the future into the past is in Space. On the second semi-circle, the transformation will take place in a time environment. In time it will be possible to move, and space will move itself.

A ring is obtained from periodic transformations. Two transformations return the system to its original state. Consequently, the transformation in the circle is carried out at  $360^\circ$ . In this version, the circle is a Mobius tape, with two turns. Transformation occurs, and laws remain. In this case, there must be a Basic Law. In our case, the emergence of conservation laws, isotropy and continuity, follows from the functionality of the Basic Law. The Basic Law should be without dimensions, in another way, all laws and properties can not be described. Without dimensions, this is abstract. Everything describes abstractly, mathematics and philosophy.

The basic law prescribes the processes of transformation in nature. Transformation means a constant sum of components. Otherwise, the components will disappear or grow to the dimensions of infinite characteristics. What makes the sum of components constant? There are two answers:

- There is another "dark" component that moves in the universe. The search for "darkness" - this is the withdrawal of the head into the sand - immediately becomes dark and calm.
- Change of constants, i.e. in Nature there is a mutual dependence of constants and motion.

I'm a supporter of the second option, considering the conservation laws as primary (laws, not constants! Note for readers on the diagonal). Primary laws are given by the properties of duality and complexity. Continuity and isotropy is a consequence of compliance with these laws. I confirm this with a question from the opposite: "Which law of" non-conservation "follows from the discreteness of matter?" I will be glad to receive an explanation and give my own. Two constants  $x + y = const$  (duality) and  $x \times y = const$  (complexness) are considered above. Duality and complexity create continuity. At the same time, the equation  $MV=TE$  describes matter, which is a discrete system. What creates discreteness? There are two possibilities: The first. "God created whole numbers. Everything else is from a person. " The accuracy of the phrase is not guaranteed. I forgot the author. There remained the meaning - continuity created by man, discreteness (matter + man) created by God. The second. From continuity, there is no longer anything.

For matter, the second option is the unity of complexity and duality. Duality arises from disintegration. The decay is primary. Solving the system of equations  $x + y = const$  and  $x \times y = const$ , we obtain two conclusions  $(-x^2)=const$  and  $(-y^2)=const$ .

For matter, combining the properties of duality and complexity, described by the equation  $x_2+y^2=const$ . This equation describes the circle in the plane. The presence of three components creates a discrete sphere. It is shown above that nature consists of 4 phenomena. The fourth component creates a ball from the sphere, i.e. a volume and a discreteness are created from the surface. Each component can be the fourth. As a result, a discrete mass appears, a discrete physical space (volume), a discrete energy - a photon and a discrete time - a "now" moment.

## Analysis

Our world is simultaneously dual and complex, hence the equations  $y = -x$  and  $y = \text{const}/x$  describe the basic laws of Nature. In accordance with the presented equations, there are changes in Nature. Integration (summation) of complex processes creates a logarithmic dependence of the course of the process. Differentiation (division) creates an acceleration of the development of systems, and the growth of the system enhances the processes of separation. Integration (summation of contradictions) of duality creates an acceleration of the progress of the process and promotes the emergence of a cycle. The differentiation (separation of contradictions) of duality creates constancy. Being positioned relative to each other along the normal, the complexity and duality interact as co-factors. There are two variants of multiplication:

1.  $x \times c/x = c$  (*const*).

A constant value in the interaction of duality and completeness sets the conditions for the existence of conservation laws. In other words, the equation *const.* describes the general law of conservation of the interacting potentials of Nature. Everything in Nature is transformed, not arising from nothing and not disappearing without a trace.

Constant value, inherently abstraction. The abstraction of the interaction of processes in Nature allows us to describe all these processes by an abstract method - mathematically. The ability to describe all processes in Nature has made mathematics the basis for all sciences. The constant, under the interaction of duality and completeness, is an abstract quantity. It turns out that our Nature originated from Abstraction / Nothing and Emptiness is my most potential that is in Nature.

2.  $x / (c/x) = x^2 / c$

The quadratic dependence, under the interaction of duality and complexity, creates conditions for the acceleration of processes in Nature. Integration of this kind of processes creates the possibility of the existence of forms and allows the forms to move in physical Space and Time. Differentiation (separation) of these processes, creates a linear dependence of the progress of the process. The presence of a variable in the equation shows that the Void is a zero / scene, for evolutionary processes in Nature.

### On the coefficient $k$ and the observance of dimensions.

$k$  - coefficient of proportionality, describing the mutual dependence of the linear size and the tempo of the body, does not depend on speed and reference frames. Lorentz changes in a moving body create a second relationship.  $E/M = \text{const}$ . From the equation  $E = MC^2$  we obtain  $E/M = C^2$ . Consequently, the speed of light does not depend on the speed of motion of bodies and frames of reference. The fact is famous. A similar derivation of the proportionality coefficients allows us to make the assertion that  $k$  - must be a known quantity.

The derivation from the formula of the proportionality coefficient  $k$  and the square of the speed of light violated the dimensionality by creating the ratio  $TV/ME = \text{const}$ . It follows from Fig. 4: The phenomena of Nature are able to "be mutually present" in each other, in different ratios. "Mutual presence" creates equality of all dimensions. Consequently, for certain conditions, a violation of dimensions in the relations is allowed.

## Conclusion

Considering the causes of the emergence of many controversial theories and hypotheses, the method used in the investigative work is applied. Based on several confirmed facts, a version of

the structure of the universe was created. Application to the version of logic, allowed to create a mathematical model of the conceptual universe. The presence of an algebraic and geometric description of the model allowed us to begin a mathematical analysis of the model. The result of the analysis was the explanation of the concept of Time, as a substantiality, analogous to the properties of space. Differences of substances: The space is "Everything" and is at rest, Time moves itself and is a point (moment "now"), on the axis of the Future - the Past. The acceptance of time by physical reality created the possibility of deriving the relationship between the mutual connection of matter and the physical vacuum. Mathematical analysis of the relationship:

- allows you to explain the causes of physical duality;
- eliminates the need to use "dark" matter and energy, while explaining the facts in astrophysics;
- explains the emergence of discreteness (matter);
- explains the occurrence of square, linear and logarithmic dependencies of existing physical processes.

Last thing. A crisis is an opportunity to realize alternative views and actions.

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