

# Alternative to SI

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The author in this article brings to the attention of interested readers his system of physical quantities, which should be taken as a system of units of nature. This is the natural system of units of nature. It is proportional to the SI system. This is a real alternative to SI. The quanta of these units represent, in turn, or form an elementary system of units of nature. The SI system will serve people for a long time to come. She is practical and comfortable. But the natural system of units of nature will undoubtedly become the scientific system of units.

**Key words:** nature, Universe, law of nature, matter, dialectics, motion, time, science, physics, physical quantity, system of units SI, natural system of units of nature, elementary system of units of nature.

We all understand what the SI system of units is. We understand its necessity and practical significance. This is a convenient and practical system of units in everyday life, in production and in science. It is based on a unit of length - a meter, a unit of mass - a kilogram, a unit of time - a second.

The organization “International Bureau of Weights and Measures (BIPM)” maintains the SI up to date, in its constant refinement and updating in connection with the constant development of science and technology. In 2019, the 9th edition of the “SI Brochure” appeared.

“The International System of Units, SI, is preferably used throughout the world as the main language in science, technology, industry and commerce” (“SI Brochure”, 9th edition, 2019)

The SI system of units has been recognized and spread throughout the world. This is a convenient and practical system in everyday life, at work and in science. This SI system of units will be used by humans forever. But for scientific purposes, there is a more convenient system. This is an alternative system of units to the SI. This system was found and established within the framework of the “Theory of Nature”. This system of units is considered in this article.

## **Part I**

Dear readers, allow me to introduce myself.

I am Robert Yusupov from Vladivostok, Russia, an independent researcher, dialectical materialist, Marxist, communist.

I have a book “Theory of Nature” (TN) published in 2021.

The book is devoted to physics and cosmology (cosmogony), their foundations. This is a scientific monograph. The presentation of the foundations of physics and cosmogony (cosmology) is conducted in this book from the standpoint of the only truth and scientific Marxist-Leninist philosophy (MLF) and its first section, which is called the philosophy of dialectical materialism (diamat). MLF was in fact the state philosophy in the USSR. Such was the philosophy of dialectical materialism.

I strictly adhere, follow and stand firmly on the foundation of the philosophy of dialectical materialism. This is the only true and scientific philosophy. This is the philosophy of nature itself. And nature is fundamentally material and dialectical. The materiality of nature means that all bodies, objects, objects in nature are material, that is, they ultimately consist of matter, of the matter of nature. The dialectic of nature means that all material bodies in nature are in constant incessant motion, movement, displacement, change, evolution.

I must, if necessary, make some important clarifications regarding my position. My position is simple, open and clear. My position is a

dialectical-materialist position in the views on nature, society and the process of our knowledge. This ideological position has been worked out by the philosophy of dialectical materialism. This is the only true and scientific philosophy. All other philosophies are anti-materialistic in content, that is, idealistic or dualistic, gravitating towards esotericism, mysticism, religion. All other philosophies are fundamentally false and anti-scientific in content philosophies, philosophical theories, views, schools and teachings.

My outlook and my world understanding are wholly and completely dialectical-materialistic. In my scientific research of nature, I used and continue to use the scientific dialectical-materialistic method of cognition. The founder of the dialectical-materialistic method of cognition is Karl Marx.

Nature is an objective reality that exists outside of our consciousness and independently of our consciousness. Nature exists absolutely. The last statement, the proposition is true and scientific. Nature exists irrespective of anything or anyone. Matter is the most important essence of nature. Matter is the unique and only substance of nature. Matter is in constant motion. Motion is an attribute (the most important property) of matter. It does not exist apart from matter. Likewise, matter without motion does not exist. Time is the unique and only form of existence of moving matter. Time is inextricably, organically connected with moving matter. Time is another essence of nature. Time is determined by matter. Time is measured by matter. Matter is the measure of everything in nature. We must talk about the triune essence of nature “matter + motion + time” (“matter & motion & time”). Matter and time are the fundamental essences of nature. These are different entities, but they are organically, inextricably linked entities, these entities that exist in their indissoluble unity. This unity extends to the degree of identification of physical quantities that reflect these essences of nature. But this in no way contradicts the proposition “matter is primary”. This is the approach to understanding these entities adopted in the “Theory of Nature”. This fully corresponds to the order of things in nature.

Physics is the main science of nature. The subject area of physics, the subject of its interest and study is all nature, all physical phenomena and processes occurring in nature. The phenomena and processes of nature through their physical properties are reflected in the conceptual apparatus of physics in the form of physical quantities. A physical quantity is the basic concept and the main category of physics. But matter, being the basis of nature, the main, fundamental essential essence of nature, the unique substance of nature, is not reflected correctly and adequately in the conceptual apparatus of modern physics, and, above all, the matter of nature is not represented as a physical quantity. The matter of nature is not in the list of physical quantities in the theory of modern physics (TMP). This is nonsense. This is depressing. This leads to certain reflections and raises certain doubts about the truth and scientific nature of modern physics.

The “SI Brochure” presents 7 basic physical quantities, but matter is not included in this list. As part of the SI reorganization, the “SI Brochure” 9th edition 2019 introduces the 7 defining SI constants. This is a new approach to building the SI system of units.

The “SI Brochure” 9th edition 2019 says:

“The definition of SI units is based on a set of seven defining constants. The entire system of units can be derived from the fixed values of these defining constants expressed in SI units. These seven defining constants are the fundamental feature of the definition of the entire system of units.”

But even in the list of these 7 defining constants there is no matter of nature.

Of course, beforehand, within the framework of the scientific study of nature with the help of physics, at the very beginning of the study of physics, the basic question of physics, the question of a specific representation and a specific manifestation of the matter of nature (in nature), must be posed and resolved without fail. And this solution should be like this: “The concrete representation of matter in nature is the content of fundamental (elementary) particles. The content of fundamental

(elementary) particles is “pure”, concrete matter of nature”. This is the only correct and true solution of the fundamental question of physics. But even if the fundamental question of physics is not explicitly posed in the first textbook on physics, it is implicitly solved. In the theory of modern physics (TMP), this issue is resolved idealistically, anti-materialistically. The matter of nature is not revealed in its specific representation and in its specific manifestation. And the matter of nature, as an objective reality, turned out to be outside the subject area of physics, outside the framework of the study of physics. And the matter of nature is not introduced into the conceptual apparatus of physics in its adequate reflection. The matter of nature is not introduced into the bosom of physics as the main physical quantity. Physics, according to the statements of physicists, studies nature, but its primary, main essence - matter, it ignores in every possible way, does not notice, does not recognize. Here is the main mistake of the theory of modern physics (TMP). This is the main reason for the fundamental systemic crisis in modern physics. Nature is fundamentally material and dialectical. But modern physics (under the leadership of the party of physicists) has withdrawn itself from nature, has risen above nature to an idealistic height, has given itself over to anti-materialism.

Over the past century, experimental physicists have openly and thoroughly studied several hundred fundamental (elementary) particles. Catalogs of fundamental (elementary) particles have been compiled. We know a lot about fundamental (elementary) particles. But the main thing that we know is that all these fundamental (elementary) particles are minimal material bodies that actually exist in nature. But simply stating the materiality of the particles is not enough. It is necessary to indicate the sign of this materiality. And this sign is that the content of these particles is the “pure”, concrete matter of nature. This conclusion is long overdue. This fact has long been on the surface. This fact constantly reminds of itself when dealing with fundamental (elementary) particles. But the physicists of the last century seem to have gone blind. And physicists do not see this fact, they do not notice, they do not recognize it. The party of modern physicists has not been able to recognize this fact and draw this conclusion for almost the last 120-130 years. Why?! Anti-materialism, the ideas of anti-

materialism, and therefore idealism, the ideas of idealism, have widely penetrated into modern physics and are deeply rooted in the minds of the vast majority of modern physicists (VMMP). Metastases of idealism have struck the consciousness of the vast majority of modern physicists (VMMP). Modern physics has moved away from material nature to an idealistic distance. Materialism has actually been ousted from the theory of modern physics (TMP). That's why! And the main confirmation of this thesis is the absence of matter in the list of basic physical quantities. In modern physics, we see the absence of matter in a proper, adequate reflection, representation corresponding to nature. This is the fundamental error of the theory of modern physics (TMP). This is the main reason for the modern fundamental, long-term, global, systemic crisis in physics, the crisis of the foundations of physics and the whole of natural science.

But if the content of fundamental (elementary) particles is “pure” and concrete matter of nature, then this is the main property of all these particles. And the properties of material bodies are reflected in physics as physical quantities. This means that the property “to be matter”, as the content of fundamental (elementary) particles, must be adequately reflected in the conceptual apparatus of physics as the main physical quantity. This is the absolutely correct, true and logically impeccable direction of the movement of our thoughts. But the main question of physics, the question of a specific representation of matter in nature, is not posed at all and is not resolved within the framework of the theory of modern physics (TMP). This is the basic, fundamental mistake of modern physics, of modern party of physicists, of entire physical community over the past century. But matter is not recognized properly, adequately in modern physics. And materialism was expelled from physics and idealism took its place.

All this hard, creative, research work regarding the specific matter of nature, its specific representation in nature and its introduction into the conceptual apparatus of physics as the main physical quantity, was carried out and done in full by the author as part of his independent scientific study of nature in the period 2011-2021 years. The results of this study are



presented at the same time in numerous articles by the author. The same articles were also enclosed in the author's letters to various numerous instances of the party of modern physicists. None of the physicists gave a positive response. Letters on TN were also sent to various state structures of the Russian Federation. The result is the same. And in 2021, the author published the book "Theory of Nature", which outlines all the results of the author's research of nature for 2011 - 2021.

I invite all respected readers to read and get acquainted with this scientific book. This is undoubtedly a useful and very necessary book for any researcher of nature, for any person who is interested in the truth about nature (about the structure and evolution of nature, the Universe), who seeks to know the fundamental laws of nature.

Everyone who understands the original lie of (1) all kinds of religious teachings, currents, instructions, (2) various kinds and varieties of idealistic theories, (3) in abundance of mystical and esoteric fabrications, constructions, conjectures, (4) numerous, designed for any the taste of basically anti-materialistic, pseudo-scientific works, plots, articles will be able to find the truth in the book "Theory of Nature". This is the truth about nature, the truth about the Universe, the truth about the fundamental laws of nature and its evolution.

About 40 fundamental problems of the foundations of nature, the foundations of the universe, the problems of the structure, structure and evolution of the Universe have been solved within the framework of the TN. These are also (at the same time) fundamental problems of physics, cosmogony (cosmology), fundamentals of physics, problems of general natural science. The scientific potential of the TN corresponds to about 20 Nobel Prizes in physics. The scientific potential of the TN also, no doubt, corresponds to 10 Nobel Prizes in cosmogony (cosmology), if such a nomination were established. But the most important thing to understand is that today and for 10 years now (since 2013-2014) the "Theory of Nature" is a Revolution in physics and cosmogony (cosmology). But this revolution has not been noticed by the entire modern physical army,

physical party, physical authorities, the entire physical community for the past 10 years. “I didn’t even notice the elephant!”

Among other fundamental problems within the framework of the “Theory of Nature” the problem of elementary units of nature (EUN) is also solved. And the basis of these units is the matter of nature. And this is a real alternative to SI.

Let us consider in detail the question of how the fundamental problem of the system elementary units of nature (SEUN) is solved within the framework of the “Theory of Nature”? How was this system discovered and found in the framework of the author's research on the “Theory of Nature”? This will be discussed further.

**Step one.** The three defining SI constants, a simple statement of their existence.

Table 1

Defining constant	Notation	Numeric value	Unit
speed of light in vacuum	$c$	299 792 458	$\text{m s}^{-1}$
Newton's gravitational constant	$G$	$6,67430 \cdot 10^{-11}$	$\text{m}^3 \text{kg}^{-1} \text{s}^{-2}$
fine structure constant	$\alpha$	$7,297\ 352\ 5693 \cdot 10^{-3}$	1

The data in this table is from nist.gov (<http://physics.nist.gov/constants>, <https://physics.nist.gov/cuu/Constants/index.html>).

**Step two.** Derivative constant (Planck force).

Table 2

Defining constant	Notation	Defining formula	Numeric value	Unit
Planck force	$F_{Pl}$	$F_{Pl} \equiv c^4 \cdot G^{-1}$	$1,210\ 255\ 564 \cdot 10^{44}$	$\text{kg m s}^{-2}$



The calculation of the value of this quantity was made directly by the defining formula after substituting the corresponding values into the right side of the formula.

**Step three.** Basic physical quantities.

Table 3

Defining constant	Notation	Numeric value	Unit
unique constant of nature (of the Universe)	UCN	$1,210\ 255\ 564 \cdot 10^{44}$	1
quantum of matter	EUM	$8,262\ 717\ 640 \cdot 10^{-45}$	$\mu^4$

It is worth noting that  $UCN^{-1} = 8,262\ 717\ 640 \cdot 10^{-45}$ .

**Step four.** Definition of basic physical quantities.

Table 4

Defining constant	Notation	Defining formula	Numeric value	Unit
unique constant of nature (of the Universe)	UCN	$UCN \equiv \{F_{PI}\}$	$1,210\ 255\ 564 \cdot 10^{44}$	
quantum of matter	EUM	$EUM \equiv UCN^{-1} \mu^4$	$8,262\ 717\ 640 \cdot 10^{-45}$	$\mu^4$
quantum of time	EUT	$EUT \equiv EUM$ $EUM \equiv UCN^{-1} \mu^4$	$8,262\ 717\ 640 \cdot 10^{-45}$	$\mu^4$

**Step five.** Determination of additional enlarged basic physical quantities.

Table 5

Defining constant	Notation	Defining formula	Numeric value	Unit
natural unit of matter	NUM	$NUM = UCN\ EUM$	1	$\mu^4$
natural unit of time	NUT	$NUT \equiv NUM$ $NUT = UCN\ EUT$	1	$\mu^4$

It should be noted that in the above three tables, the natural unit of matter (NUM) actually acts as a unit  $\mu^4$ .

Matter is primary! This is the principle of nature. And therefore, the designation of the unit of a physical quantity with a symbol to the power of  $\mu^4$  is equivalent to the designation NUM. This is a clear redundancy. But this redundancy is justified. In the future, this will be clear when considering the physical quantities quantum length (EUL) and quantum mass (MAM). It's worth the wait.

But for now, we note that in this case the following relations, identities for the physical quantities matter and time take place:

$$\text{NUM} = 1 \text{ NUM}, \text{ NUM} = 1\mu^4,$$

$$\text{NUT} = 1 \text{ NUT}, \text{ NUT} = 1\mu^4,$$

$$\text{EUM} \equiv \text{UCN}^{-1} \text{ NUM}, \text{ EUM} \equiv \text{UCN}^{-1} \mu^4, \text{ NUM} \equiv 1\mu^4,$$

$$\text{EUM} \equiv \text{UCN}^{-1} \text{ NUM}, \text{ EUT} \equiv \text{UCN}^{-1} \mu^4, \text{ NUT} \equiv 1\mu^4.$$

In these identities, we take into account, that  $\text{NUM} \equiv \text{NUT} \equiv \mu^4$ .

**Step six.** Let us present a number of important statements of the “Theory of Nature”.

It is stated that the physical quantity A (age) expresses the current universal time in units of NUT. It also expresses the current age of the Universe in units of NUT.

It is stated that the evolution time of the Universe is a finite value. The limits of the change in the age of the Universe (A in units of NUT) or the time frame of the evolution of the Universe are as follows:

$$\text{UCN}^{-1} \leq A \leq \text{UCN}.$$

Exactly so, and not  $1 \leq A \leq \text{UCN}$ , as it suggests itself. If we count the universal time or the age of the Universe (A) in time quanta, then the limits of this change will be as follows:

$$1 \leq A \leq \text{UCN}^2.$$

It is stated that the physical quantity  $M$  expresses the current available amount of matter in the Universe in units of NUM. This amount of matter was produced by the Singularity and entered the Universe by the current universal time  $A$  (in units of NUT). The limits of change in the available amount of matter ( $M$ ) (in NUM units) in the Universe, as established in the TN, are as follows:

$$1 \leq M \leq UCN^2.$$

It is stated that one natural unit of matter (NUM) enters the Universe from the Singularity in one quantum of time (EUT).

By virtue of the above, there are simple relationships, identities that show a one-to-one relationship between physical quantities (1) the current amount of matter in the Universe ( $M$  in NUM units) and (2) the current age of the Universe or the current universal time ( $A$  in NUT units):

$$M \equiv UCN \cdot A,$$

$$A \equiv \frac{M}{UCN} \equiv UCN^{-1}M.$$

It also follows from this that the total available amount of matter ( $M$  in NUM units) in the Universe for the entire time of its evolution lies within limits:

$$1 \leq M \leq UCN^2.$$

**Step seven.** About the quantum of length.

Within the framework of the “Theory of Nature” it has been established and found that the quantum of length (EUL) is not a constant value, it changes with time, with universal time or with the age of the Universe ( $A$  in units of NUT). Quantum length (EUL) is an increasing value, is a function of the age of the Universe (EUL( $A$ )). The material carrier of the quantum of length (EUL) in nature is a grain of matter. The diameter of a grain of matter is a quantum of length. This is the lower limit of quantum

of matter pulsation. The formula for changing the quantum of length (EUL) with the age of the Universe (A in units of NUT) is presented in Table 6 below. The quantum of length (it is also the diameter of a grain of matter) is one of the main characteristics of the Universe. And because of this circumstance, it should be considered the main physical quantity. But formally, according to the defining formulas, it appears, figures as a derivative physical quantity. It is based on matter, the quantum of matter (EUM). The quantum of length (EUL(A)) according to the “Theory of Nature” is closely, organically inextricably linked with the quantum of matter (EUM) pulsating in the rhythm and pace of nature. The same Table 6 also shows the defining formula for the mass quantum (MAM), this is the mass of a grain of matter. This physical quantity is also a function of the age of the universe, or universal time (A in NUT units). But this is already decreasing quantity. According to the “Theory of Nature”, the quantum of mass MAM(A) is organically inseparably, closely connected with the quantum of matter. All this is reflected in Table 6 below. It is worth considering it carefully.

Table 6

Name of physical quantity	Notation	Defining formula	Unit
quantum of matter	EUL	$\uparrow \text{EUL}(A) \equiv A^{0,125} \cdot \text{EUM}^{0,875}$ $\uparrow \{\text{EUL}(A)\} = \{A\}^{0,125} \cdot \text{UCN}^{-0,875}$	$\mu^4$
quantum of time	MAM	$\text{MAM} \equiv \frac{\text{EUM}}{\text{EUL}}$ $\downarrow \text{MAM}(A) \equiv A^{-0,125} \cdot \text{EUM}^{0,125}$ $\downarrow \{\text{MAM}(A)\} = \{A\}^{-0,125} \cdot \text{UCN}^{-0,125}$	1

Notes. The column “Defining formula” gives a defining formula of a general form (if any), a defining formula in the form of an expression containing two physical quantities (with exponents): (1) the age of the Universe or universal time (A in units of NUT,  $\mu^4$ ) and (2) quantum of matter (EUM) in NUM units ( $\mu^4$ ). In the same column, the line below also gives a numerical equality that determines the numerical value of the determined physical quantity through the numerical values of two physical

quantities (with exponents) (1) the age of the Universe or universal time (A in units of NUT) and (2) a unique constant of nature (UCN).

The symbols “arrow up” or “arrow down” before the defining formulas in this table indicate the nature of the change in the physical quantity following the arrow. The up arrow symbol indicates an increasing value. The down arrow symbol indicates a decreasing value. It is worth paying attention to the dimensions of the units of these quantities. While the dimension of the quantum of matter is expressed by the symbol  $\mu^4$ , the dimension of the quantum of length is also expressed by the symbol  $\mu^4$ . But the dimension of the quantum of mass is expressed by the symbol 1, which means that the mass turns out to be a dimensionless quantity. This is interesting.

### Step eight.

Here are three more defining formulas for physical quantities: the maximum velocity in nature (MVN), the gravitational value of the Universe (GVU) and momentum (IMP). These will be derived physical quantities. The first two physical quantities introduced into consideration within the framework of the “Theory of Nature” are a kind of analogues for physical quantities in theory of modern physics (TMP) the speed of light in vacuum ( $c = 299\,792\,458\text{ m s}^{-1}$ ) and Newton's gravitational constant ( $G = 6,67430 \cdot 10^{-11}\text{ m}^3\text{ kg}^{-1}\text{ s}^{-2}$ ). The last values (analogues of TMP) are constant values within the TMP. We will talk about the third physical quantities momentum (IMP) later.

Table 7

Name of physical quantity	Notation	Defining formula	Unit
maximum velocity in nature	MVN	$\text{MVN} \equiv \frac{\text{EUL}}{\text{EUT}}$ $\uparrow \text{MVN}(A) \equiv A^{0,125} \cdot \text{EUM}^{-0,125}$ $\uparrow \{\text{MVN}(A)\} = \{A\}^{0,125} \cdot \text{UCN}^{0,125}$	1
gravitational value of the Universe	GVU	$\text{GVU} \equiv \frac{\text{EUL}^3}{\text{MAM} \cdot \text{EUT}^2}$ $\uparrow \text{GVU}(A) = A^{0,5} \cdot \text{EUM}^{0,5}$ $\uparrow \{\text{GVU}(A)\} = \{A\}^{0,5} \cdot \text{UCN}^{-0,5}$	$\mu^4$
momentum	IMP	$\text{IMP} \equiv \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1$	1

Notes. It can be seen from this table that the physical quantity maximum velocity in nature (MVN) has a dimension of 1, i.e., it is a dimensionless quantity. And the physical quantity the gravitational quantity of the Universe (GVU) has the dimension  $\mu^4$ . The physical quantity impulse (IMP) is a dimensionless quantity. The assumption about the physical quantity impulse about its identity to the dimensionless unit (1) is equivalent to the statement about the identities between physical quantities:

$$\text{MAM} \cdot \text{EUL} \equiv \text{EUT} \text{ or}$$

$$\text{MAM} \equiv \frac{\text{EUT}}{\text{EUL}} \equiv \frac{\text{EUM}}{\text{EUL}}.$$

The first identity represents another form of dependence between mass, length and time quanta.

The last identity is nothing but the defining identity for the mass of a grain of matter (for a quantum of mass).

At the same time, we do not forget (always remember!) the basic identity of the “Theory of Nature” between matter and time:

$$\text{EUT} \equiv \text{EUM}.$$



The same table 7 also shows the defining formula for the physical quantity “impulse” (IMP). We will need it soon in a conversation about the fine structure constant ( $\alpha$ ).

Comparing the defining formulas for the mass quantum

$MAM \equiv \frac{EUM}{EUL} \equiv \frac{EUT}{EUL}$  and the maximum speed in nature (in the Universe)

$MVN \equiv \frac{EUL}{EUT}$ , we come to an interesting conclusion:

$$MAM \equiv \frac{1}{MVN} \text{ or } MVN \equiv \frac{1}{MAM} \text{ or } MAM \cdot MVN \equiv 1.$$

This means that these two dimensionless physical quantities are strictly reciprocal quantities. And their product is dimensionless 1. All this takes place in the natural system of units of nature (NSU). Knowing the current value of one of them, we can easily determine the value of the other. So we know that for the present age of the Universe  $\{MVN\} = 299\,792\,458$ . In this case  $\{MAM\} = \{MVN\}^{-1} = 299\,792\,458^{-1} = 3,335\,640\,9520 \cdot 10^{-9}$ .

**Step nine.** The assumption of the existence of a system of elementary units of nature (SEUN)  $ESU\{MAM, EUL, EUT\}$  is a very important assumption in the “Theory of Nature”. This assumption is equivalent to the assumption of the existence of transition coefficients ( $k_m, k_l, k_t$ ) between the units  $SI\{kg, m, s\}$  and the corresponding units of the system of elementary units of nature (SEUN)  $ESU\{MAM, EUL, EUT\}$ . In the framework of the “Theory of Nature” such coefficients are found, established, calculated. Thus, the real existence in nature of the elementary units of nature - the quantum of mass (MAM), the quantum of length (EUL), the quantum of time (EUT) has been proved.

The defining formulas in Table 7 eventually lead us, with logical necessity, to the following system of equalities (identities) using transition coefficients:

$$\left\{ \begin{array}{l} \text{MVN} \equiv 1 \frac{\text{EUL}}{\text{EUT}} \equiv \{c\} \frac{m}{s} \equiv \{c\} \frac{k_l \text{EUL}}{k_t \text{EUT}} \equiv \left( \{c\} \frac{k_l}{k_t} \right) \cdot \frac{\text{EUL}}{\text{EUT}} \\ \text{GVU} \equiv 1 \frac{\text{EUL}^3}{\text{MAM} \cdot \text{EUT}^2} \equiv \{G\} \frac{m^3}{\text{kg s}^2} \equiv \{G\} \frac{k_l^3 \text{EUL}^3}{k_m \text{MAM} \cdot k_t^2 \text{EUT}^2} \equiv \left( \{G\} \frac{k_l^3}{k_m \cdot k_t^2} \right) \cdot \frac{\text{EUL}^3}{\text{MAM} \cdot \text{EUT}^2} \\ \text{IMP} \equiv 1 \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv \alpha \frac{\text{kg m}}{s} \equiv \alpha \frac{k_m \text{kg} \cdot k_l m}{k_t s} \equiv \alpha \frac{k_m \cdot k_l}{k_t} \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv \left( \alpha \frac{k_m \cdot k_l}{k_t} \right) \cdot \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \end{array} \right. .$$

Briefly, this system can be represented as follows:

$$\left\{ \begin{array}{l} 1 \frac{\text{EUL}}{\text{EUT}} \equiv \left( \{c\} \frac{k_l}{k_t} \right) \cdot \frac{\text{EUL}}{\text{EUT}} \\ 1 \frac{\text{EUL}^3}{\text{MAM} \cdot \text{EUT}^2} \equiv \left( \{G\} \frac{k_l^3}{k_m \cdot k_t^2} \right) \cdot \frac{\text{EUL}^3}{\text{MAM} \cdot \text{EUT}^2} \\ 1 \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv \left( \alpha \frac{k_m \cdot k_l}{k_t} \right) \cdot \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \end{array} \right.$$

The first two equalities (identities) in these systems are completely transparent, clear and understandable. And the third equality (identity), where the fine structure constant (FSC,  $\alpha$ ) appears, is the assumption of the author of “Theory of Nature”. But as it turns out later, after analyzing the consequences that follow from this, this assumption will turn out to be absolutely correct.

The last system of equalities, identities logically leads us to a system of three numerical equalities, equations, where the unknowns are the transition coefficients ( $k_m, k_l, k_t$ ) from the system of elementary units of nature (SEUN) ESU {MAM, EUL, EUT} to the system of units SI {kg, m, s}. Here is the system of three simple equations:

$$\left\{ \begin{array}{l} \frac{k_l}{k_t} = \{c\}^{-1} \\ \frac{k_l^3}{k_m \cdot k_t^2} = \{G\}^{-1} \\ \frac{k_m \cdot k_l}{k_t} = \alpha^{-1} \end{array} \right. \quad (1)$$

The solution here is simple, the solution here is unambiguous:

$$\left\{ \begin{array}{l} k_m = \alpha^{-1} \cdot \{c\} \\ k_l = \alpha^{-1} \cdot \{c\}^3 \cdot \{G\}^{-1} \\ k_t = \alpha^{-1} \cdot \{c\}^4 \cdot \{G\}^{-1} \end{array} \right. \quad (2)$$

The numerical values of the multipliers from the right parts of these equations, equalities are known, after substituting them and performing the appropriate mathematical operations, we will get real single-valued transition coefficients.

Conclusion: This very, this representation of the found values of the transition coefficients proves the real existence in nature of the elementary units of nature, such as quanta of mass (MAM), length (EUL) and time (EUT).

But the “Theory of Nature” also indicates the material carrier of these standard units of nature, and this is a grain of matter. A grain of matter is the lower limit of the pulsation of a quantum of matter. The lower limit is the same for all matter quanta. All quanta of matter in the Universe pulsate strictly synchronously in the same rhythm and pace of nature. The upper limit of matter quantum pulsation is a fundamental (elementary) particle. The upper limits of the pulsation of different matter quanta are generally different. The diameter of a quantum of matter in its upper limit of pulsation uniquely determines the type of fundamental (elementary) particle (proton, neutron, electron, etc.). This is another of the most important, fundamental conclusions of the TN.

**Step ten.** Talk about the fine structure constant (FSC).

The author a few paragraphs earlier made his personal assumption regarding the physical quantity of the momentum (IMP) and the physical quantity of the fine structure constant (FSC):

$$\text{IMP} \equiv 1 \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv \alpha \frac{\text{kg m}}{\text{s}}.$$

A preliminary assumption was made about the identity:

$$\frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1.$$

The assumption about momentum and FSC leads to the following (see (1)):

$$\frac{k_m \cdot k_l}{k_t} = \alpha^{-1}.$$

This equality (identity) can be represented in the following equivalent form:

$$\alpha = \frac{k_t}{k_m \cdot k_l}.$$

Let's make the following equivalent transformations:

$$\alpha = \frac{k_t}{k_m \cdot k_l} = \frac{k_t}{k_m \cdot k_l} \cdot 1 = \frac{k_t}{k_m \cdot k_l} \cdot \frac{\text{EUT}}{\text{MAM} \cdot \text{EUL}} = \frac{k_t \text{EUT}}{k_m \text{MAM} \cdot k_l \text{EUL}} = \frac{s}{\text{kg} \cdot \text{m}}.$$

In the end, we get this wonderful equality (defining an identity):

$$\alpha = \frac{s}{\text{kg} \cdot \text{m}}.$$

This equality, identity is nothing more than the defining formula (identity) for the physical quantity fine structure constant (FSC). And the formula  $\alpha = \frac{k_t}{k_m \cdot k_l}$  gives us a formula for a specific practical calculation of the numerical value of the fine structure constant. All this is the solution to the fundamental problem of physics about the meaning and essence of the physical quantity fine structure constant (FSC). This solution is found and presented by the “Theory of Nature”. “Hurrah, comrades!” For this decision and discovery, at least the Nobel Prize in physics is due. And this is not a joke or a fake.

Conclusion: The fine structure constant (FSC) shows us how the physical quantities 1 s, 1 kg and 1 m, which are units of SI {kg, m, s}, are related to each other in the aggregate.

At the same time, this defining identity shows us that these three SI units (1 kg, 1 m and 1 s) are not independent units. Their internal organic connection with each other is represented in this defining identity. By the way, the independence of the 7 basic physical quantities was stated in the 8th edition of the “SI Brochure”, 2006.

This identity, which determines the fine structure constant, also indicates that the fine structure constant (FSC) is not a fundamental quantity of nature (the Universe). FSC is just an objective reflection of our, in general, random choice of units of mass (1 kg), length (1 m) and time (1 s).

It should be understood that for each arbitrary system of units of mass, length and time, there is its own fine structure constant.

So, for example, for the system of units GCS{g, cm, s}, the numerical value of the own FSC will be equal to:

$$a_{\text{GSC}} = \frac{\text{s}}{\text{g}\cdot\text{cm}} = 10^5 \cdot \frac{\text{s}}{1000 \text{ g}\cdot 100 \text{ cm}} = 10^5 \cdot \frac{\text{s}}{\text{kg}\cdot\text{m}} = 10^5 \cdot \alpha = 7,297\ 352\ 5693 \cdot 10^2.$$

For the system of units  $\alpha$ -SI{ $\alpha$  kg,  $\alpha$  m,  $\alpha$  s}, considered below, the own fine structure constant will be equal to the dimensionless 1:

$$a_{\alpha\text{-SI}} \equiv \frac{\alpha \text{ s}}{\alpha \text{ kg}\cdot\alpha \text{ m}} \equiv \alpha^{-1} \frac{\text{s}}{\text{kg}\cdot\text{m}} \equiv \alpha^{-1} \cdot \alpha \equiv 1.$$

When moving from the system of units SI{kg, m, s} to the system of units  $\alpha$ -SI{ $\alpha$  kg,  $\alpha$  m,  $\alpha$  s}, the numerical value of the physical quantity momentum (IMP) will become equal to 1, but this will be a dimensional quantity. Here is a chain of equivalent identities for the physical quantity momentum (IMP):

$$\text{IMP} \equiv 1 \frac{\text{MAM}\cdot\text{EUL}}{\text{EUT}} \equiv \alpha \frac{\text{kg m}}{\text{s}} \equiv \alpha \cdot \left( \alpha^{-1} \frac{\alpha \text{ kg}\cdot\alpha \text{ m}}{\alpha \text{ s}} \right) \equiv 1 \frac{\alpha \text{ kg}\cdot\alpha \text{ m}}{\alpha \text{ s}}.$$

**Step eleven.** Invariants of nature.

Quantum of matter (EUM) and quantum of time (EUT) are the true invariants of nature. These are constant, unchanging natural characteristics, quantities.

Using the defining formulas of Table 7, we write the following relations, identities:

$$MVN^4 \cdot GVU^{-1} \cdot IMP^{-1} \equiv \frac{EUL^4}{EUT^4} \cdot \frac{MAM \cdot EUT^2}{EUL^3} \cdot \frac{EUT}{MAM \cdot EUL} \equiv \frac{1}{EUT},$$

$$MVN^{-4} \cdot GVU \cdot IMP \equiv \frac{EUT^4}{EUL^4} \cdot \frac{EUL^3}{MAM \cdot EUT^2} \cdot \frac{MAM \cdot EUL}{EUT} \equiv EUT.$$

The last relation, the identity is very significant. Let's write it briefly like this:

$$MVN^{-4} \cdot GVU \cdot IMP \equiv EUT.$$

It shows that the product of physical quantities, presented on the left side of the relation, results in a quantum of time. This is true for any moment of universal time, for any age of the Universe. This ratio, identity is true in the system of elementary units of nature ESU {EUL, MAM, EUT}. But it will also be valid if the left side of this relation (and this is the product of three physical quantities) we translate into the system SI {kg, m, s}. With this translation, on the left side of the expression, we get the physical quantity quantum of time in seconds (SI unit). And all this expression will represent (express) a quantum of time (EUT) in seconds. Since the quantum of time is a constant physical quantity (like the quantum of matter), the physical quantity or physical expression  $MVN^{-4} \cdot GVU \cdot IMP$  is an invariant of nature. In any system of units, not just SI, this will be an expression that brings us to the quantum of time (EUT). Quantum of time (EUT) will be expressed in units of time in any system of units LMT {length, mass, time}.

Within the framework of the “Theory of Nature” it is shown that for the modern era of the Universe or the modern age of the Universe, the physical quantity MVN corresponds to the velocity of light in vacuum (c), the physical quantity GVU corresponds to Newton's gravitational constant (G), and the physical quantity IMP (momentum) corresponds to the fine structure constant (FSC,  $\alpha$ ).

So, the quantum of time (EUT) will be expressed (represented) in the SI system as follows:

$$EUT = \alpha \cdot \{G\} \cdot \{c\}^{-4} \text{ s.}$$



Here  $\alpha = 7,297\ 352\ 5693 \cdot 10^{-3}$  is the physical quantity of the fine structure constant (FSC).

All values of physical quantities on the right side of this expression, equalities are known to us. Therefore, we can easily calculate that the quantum of time is equal to the value:

$$1 \text{ EUT} = 6,029\ 596\ 3798 \cdot 10^{-47} \text{ s.}$$

The reverse ratio will be:

$$1 \text{ s} = \alpha^{-1} \cdot \{G\}^{-1} \cdot \{c\}^4 \text{ EUT.}$$

After substituting the numerical values into the right side of this equation, we get the following:

$$1 \text{ s} = 1,658\ 485\ 8041 \cdot 10^{46} \text{ EUT.}$$

Since the unique constant of nature (UCN) is defined by:

$$\text{UCN} = \{c\}^4 \cdot \{G\}^{-1} = 1,210\ 255\ 5643 \cdot 10^{44},$$

and wherein

$$\text{UCN}^{-1} = 8,262\ 717\ 6397 \cdot 10^{-45},$$

then we can express the second in terms of the natural unit of time (NUT) and vice versa:

$$1 \text{ NUT} = \alpha \text{ s} = 7,297\ 352\ 5693 \cdot 10^{-3} \text{ s,}$$

$$1 \text{ s} = \alpha^{-1} \text{ NUT} = 1,370\ 359\ 9908 \cdot 10^2 \text{ NUT.}$$

It should be noted that a ratio similar to the ratio

$$\text{EUT} = \alpha \cdot \{G\} \cdot \{c\}^{-4} \text{ s,}$$

which takes place in the system SI {kg, m, s}, will take place in any system of units MLT(mass, length, time). In this case, the role of  $\alpha$  will be played by the own fine structure constant for the system of units under consideration, and the quantities  $c$  and  $G$  will be, respectively, the speed of

light in vacuum and Newton's gravitational constant in the same system of units. And the role of the second (s) will be performed by the unit of time in the new system.

In the  $\alpha$ -SI $\{\alpha \text{ kg}, \alpha \text{ m}, \alpha \text{ s}\}$  system of units, this relation takes on a particularly simple form:

$$\text{EUT} = \{G\} \cdot \{c\}^{-4} \alpha \text{ s},$$

or

$$\text{EUT} = \{G\} \cdot \{c\}^{-4} \text{NUT}.$$

Once again, we note that for the  $\alpha$ -SI $\{\alpha \text{ kg}, \alpha \text{ m}, \alpha \text{ s}\}$  system of units, the numerical values of the eigen (own) physical quantities, the speed of light in vacuum and Newton's gravitational constant, will be equal to the numerical values of the corresponding physical quantities  $c$  and  $G$  in the SI $\{\text{kg}, \text{m}, \text{s}\}$ .

We also note that the unique constant of nature UCN is also an invariant of nature (the Universe).

### Step twelve.

Within the framework of the “Theory of Nature” relationships, dependencies between units of length, mass and time for the system SI $\{\text{kg}, \text{m}, \text{s}\}$  and for the system of elementary units of nature (SEUN) ESU $\{\text{MAM}, \text{EUL}, \text{EUT}\}$  are established:

$$\begin{cases} 1 \text{ kg} = \alpha^{-1} \cdot \{c\} \text{ MAM} \\ 1 \text{ m} = \alpha^{-1} \cdot \{c\}^3 \cdot \{G\}^{-1} \text{ EUL} \\ 1 \text{ s} = \alpha^{-1} \cdot \{c\}^4 \cdot \{G\}^{-1} \text{ EUT} \end{cases} \quad (3)$$

or

$$\begin{cases} 1 \text{ MAM} = \alpha \cdot \{c\}^{-1} \text{ kg} \\ 1 \text{ EUL} = \alpha \cdot \{c\}^{-3} \cdot \{G\} \text{ m} \\ 1 \text{ EUT} = \alpha \cdot \{c\}^{-4} \cdot \{G\} \text{ s} \end{cases} \quad (3')$$

In numerical values it will look like this:

$$\begin{cases} 1 \text{ kg} = 4,108\,235\,9000 \cdot 10^{10} \text{ MAM} \\ 1 \text{ m} = 5,532\,113\,1663 \cdot 10^{37} \text{ EUL} \\ 1 \text{ s} = 1,658\,485\,8041 \cdot 10^{46} \text{ EUT} \end{cases} \quad (4)$$

or

$$\begin{cases} 1 \text{ MAM} = 2,434\,134\,8071 \cdot 10^{-11} \text{ kg} \\ 1 \text{ EUL} = 1,807\,627\,5194 \cdot 10^{-38} \text{ m} \cdot \\ 1 \text{ EUT} = 6,029\,596\,3798 \cdot 10^{-47} \text{ s} \end{cases} \quad (4')$$

Note that we can take instead of SI{kg, m, s} and consider the system of units  $\alpha$ -SI{ $\alpha$  kg,  $\alpha$  m,  $\alpha$  s}. Then similar relationships between the systems of units  $\alpha$ -SI{ $\alpha$  kg,  $\alpha$  m,  $\alpha$  s} and the system of elementary units of nature (SEUN) ESU{MAM, EUL, EUT} will be presented in a simpler form (without FSC on the right side):

$$\begin{cases} 1 \alpha \text{ kg} = \{c\} \text{ MAM} \\ 1 \alpha \text{ m} = \{c\}^3 \cdot \{G\}^{-1} \text{ EUL} \\ 1 \alpha \text{ s} = \{c\}^4 \cdot \{G\}^{-1} \text{ EUT} \end{cases} \quad (3A)$$

or for reciprocals quantities in the form:

$$\begin{cases} 1 \text{ MAM} = \{c\}^{-1} \alpha \text{ kg} \\ 1 \text{ EUL} = \{c\}^{-3} \cdot \{G\} \alpha \text{ m} \cdot \\ 1 \text{ EUT} = \{c\}^{-4} \cdot \{G\} \alpha \text{ s} \end{cases} \quad (3A')$$

In numerical values it will look like this:

$$\begin{cases} 1 \alpha \text{ kg} = 2,997\,924\,5800 \cdot 10^8 \text{ MAM} \\ 1 \alpha \text{ m} = 4,036\,978\,0228 \cdot 10^{35} \text{ EUL} \\ 1 \alpha \text{ s} = 1,210\,255\,5643 \cdot 10^{44} \text{ EUT} \end{cases} \quad (4A)$$

or

$$\begin{cases} 1 \text{ MAM} = 3,335\,640\,9520 \cdot 10^{-9} \alpha \text{ kg} \\ 1 \text{ EUL} = 2,477\,100\,4310 \cdot 10^{-36} \alpha \text{ m} \cdot \\ 1 \text{ EUT} = 8,262\,717\,6397 \cdot 10^{-45} \alpha \text{ s} \end{cases} \quad (4A')$$

When passing from the system of units SI{kg, m, s} to the system of units  $\alpha$ -SI{ $\alpha$  kg,  $\alpha$  m,  $\alpha$  s} in the systems of equalities (3A) and (3A') in

comparison with the systems of equalities (3) and (3') the factors  $\alpha$  (FSC, fine structure constant) disappeared. The equations have been simplified. It is easy to see that during such a transition the numerical values of the physical quantities the speed of light in vacuum ( $c$ ) and Newton's gravitational constant ( $G$ ) remained unchanged, did not change. And the fine structure constant (FSC) will change, it will become equal to the dimensionless 1.

Consider carefully the systems of equalities (3) and (3'). In fact, the units  $\alpha$  kg,  $\alpha$  m,  $\alpha$  s (or  $\alpha$ -kg,  $\alpha$ -m,  $\alpha$ -s) define larger units for the system of elementary units of nature (SEUN): MAM, EUL, EUT. Let's call these enlarged units the system of natural units of nature (SNUN): NAM, NUL, NUT. Then systems (3A) and (3A') can be rewritten in a more natural form:

$$\begin{cases} 1 \text{ NAM} = \{c\} \text{ MAM} \\ 1 \text{ NUL} = \{c\}^3 \cdot \{G\}^{-1} \text{ EUL} \\ 1 \text{ NUT} = \{c\}^4 \cdot \{G\}^{-1} \text{ EUT} \end{cases} \quad (3B)$$

or for reciprocals quantities in the form:

$$\begin{cases} 1 \text{ MAM} = \{c\}^{-1} \text{ NAM} \\ 1 \text{ EUL} = \{c\}^{-3} \cdot \{G\} \text{ NUL} \\ 1 \text{ EUT} = \{c\}^{-4} \cdot \{G\} \text{ NUT} \end{cases} \quad (3B')$$

It is clear that the system of units  $\alpha$ -SI  $\{\alpha \text{ kg}, \alpha \text{ m}, \alpha \text{ s}\}$  and the system of natural units of nature (SNUN) NSU  $\{\text{NAM}, \text{NUL}, \text{NUT}\}$  are identical systems of units, this is really one system of units with two designations. These designations are synonyms.

Given the basic identities for the system of elementary units of nature SEUN (laws of nature):

$$\text{EUT} \equiv \text{EUM} \text{ и}$$

$$\frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1,$$

from systems (3B) and (3B') imply the following identities for the natural units of nature:

$$\text{NAM} \cdot \text{NUL} \equiv \text{UCN} (\text{MAM} \cdot \text{EUL}) \equiv \text{UCN EUT} \equiv 1 \text{ NUT},$$

$$\frac{\text{NAM} \cdot \text{NUL}}{\text{NUT}} \equiv 1 \text{ (dimensionless unit)}.$$

It's worth remembering them.

Previously, we knew similar identities for the elementary units of nature:

$$\text{MAM} \cdot \text{EUL} \equiv \text{UCN}^{-1}(\text{NAM} \cdot \text{NUL}) \equiv \text{UCN}^{-1}\text{NUT} \equiv 1 \text{ EUT},$$

$$\frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1 \text{ (dimensionless unit)}.$$

Let's represent equalities (3B) and (3B') in numerical format:

$$\begin{cases} 1 \text{ NAM} = 2,997\,924\,5800 \cdot 10^8 \text{ MAM} \\ 1 \text{ NUL} = 4,036\,978\,0228 \cdot 10^{35} \text{ EUL} \\ 1 \text{ NUT} = 1,210\,255\,5643 \cdot 10^{44} \text{ EUT} \end{cases} \quad (4B)$$

The inverse equalities (relations) for the system (4B) will be the following equalities:

$$\begin{cases} 1 \text{ MAM} = 3,335\,640\,9520 \cdot 10^{-9} \text{ NAM} \\ 1 \text{ EUL} = 2,477\,100\,4310 \cdot 10^{-36} \text{ NUL} \\ 1 \text{ EUT} = 8,262\,717\,6397 \cdot 10^{-45} \text{ NUT} \end{cases} \quad (4B')$$

**Step thirteen.** A word about elementary electric charge.

Until now, nothing has been said about the units of electric charges. It is quite clear that the phenomenon of electricity takes place in nature and the natural unit of the elementary electric charge is the charges of such fundamental (elementary) particles as, for example, the electron or the proton. The elementary charge is the charge of an electron.

How is the question of the units of elementary electric charge solved within the framework of the “Theory of Nature”?

Let us once again pay closer attention to the previously presented system (3)

$$\begin{cases} 1 \text{ kg} = \alpha^{-1} \cdot \{c\} \text{ MAM} \\ 1 \text{ m} = \alpha^{-1} \cdot \{c\}^3 \cdot \{G\}^{-1} \text{ EUL} \\ 1 \text{ s} = \alpha^{-1} \cdot \{c\}^4 \cdot \{G\}^{-1} \text{ EUT} \end{cases} \quad (3)$$

and the system inverse to it (3')

$$\begin{cases} 1 \text{ MAM} = \alpha \cdot \{c\}^{-1} \text{ kg} \\ 1 \text{ EUL} = \alpha \cdot \{c\}^{-3} \cdot \{G\} \text{ m} \\ 1 \text{ EUT} = \alpha \cdot \{c\}^{-4} \cdot \{G\} \text{ s} \end{cases} \quad (3')$$

These systems show the relationship between the system of units SI{kg, m, s} and the system of elementary units of nature (SEUN) ESU{MAM, EUL, EUT}.

Taking into account the defining identity for the unique constant of nature  $UCN \equiv \{c\}^4 \cdot \{G\}^{-1}$ , systems (3) and (3') can be rewritten as:

$$\begin{cases} 1 \text{ kg} = \alpha^{-1} \cdot \{G\}^{0,25} \cdot UCN^{0,25} \text{ MAM} \\ 1 \text{ m} = \alpha^{-1} \cdot \{G\}^{-0,25} \cdot UCN^{0,75} \text{ EUL} \\ 1 \text{ s} = \alpha^{-1} \cdot UCN \text{ EUT} \end{cases} \quad (3'')$$

and the system inverse to it (3''')

$$\begin{cases} 1 \text{ MAM} = \alpha \cdot \{G\}^{-0,25} \cdot UCN^{-0,25} \text{ kg} \\ 1 \text{ EUL} = \alpha \cdot \{G\}^{0,25} \cdot UCN^{-0,75} \text{ m} \\ 1 \text{ EUT} = \alpha \cdot UCN^{-1} \text{ s} \end{cases} \quad (3''')$$

In this representation, it becomes absolutely clear and logically clear and flawless how the added line should look to take into account the elementary electric charge. This is the charge of the electron (e). Within the framework of the TN, it is denoted by the triune symbol EUE, so  $EUE \equiv e$ . One more moment. In order to add the fourth elementary unit for the elementary electric charge (electron charge) EUE to these three elementary units (mass, length and time), we need to add the natural unit of elementary electric charge (CUE). This unit will be a much larger unit



of electric charge than the elementary electric charge (electron charge). This unit (CUE) will be a kind of alternative for the coulomb (C) unit of electric charge. It can be very conditionally called its “generalized coulomb”. Systems (3'') and (3''') are transformed into systems of four equalities:

$$\begin{cases} 1 \text{ kg} = \alpha^{-1} \cdot \{G\}^{0,25} \cdot \text{UCN}^{0,25} \text{ MAM} \\ 1 \text{ CUE} = \alpha^{-1} \cdot \text{UCN}^{0,5} \text{ EUE} \\ 1 \text{ m} = \alpha^{-1} \cdot \{G\}^{-0,25} \cdot \text{UCN}^{0,75} \text{ EUL} \\ 1 \text{ s} = \alpha^{-1} \cdot \text{UCN} \text{ EUT} \end{cases} \quad (5)$$

and the system inverse to it (5')

$$\begin{cases} 1 \text{ MAM} = \alpha \cdot \{G\}^{-0,25} \cdot \text{UCN}^{-0,25} \text{ kg} \\ 1 \text{ EUE} = \alpha \cdot \text{UCN}^{-0,5} \text{ CUE} \\ 1 \text{ EUL} = \alpha \cdot \{G\}^{0,25} \cdot \text{UCN}^{-0,75} \text{ m} \\ 1 \text{ EUT} = \alpha \cdot \text{UCN}^{-1} \text{ s} \end{cases} \quad (5')$$

In numerical notation, the systems of equalities (5) and (5') will be represented as follows:

$$\begin{cases} 1 \text{ kg} = 4,108\,235\,9000 \cdot 10^{10} \text{ MAM} \\ 1 \text{ CUE} = 1,507\,555\,1702 \cdot 10^{24} \text{ EUE} \\ 1 \text{ m} = 5,532\,113\,1663 \cdot 10^{37} \text{ EUL} \\ 1 \text{ s} = 1,658\,485\,8041 \cdot 10^{46} \text{ EUT} \end{cases} \quad (5A)$$

and, accordingly:

$$\begin{cases} 1 \text{ MAM} = 2,434\,134\,8071 \cdot 10^{-11} \text{ kg} \\ 1 \text{ EUE} = 6,633\,256\,4127 \cdot 10^{-25} \text{ CUE} \\ 1 \text{ EUL} = 1,807\,627\,5194 \cdot 10^{-38} \text{ m} \\ 1 \text{ EUT} = 6,029\,596\,3798 \cdot 10^{-47} \text{ s} \end{cases} \quad (5A')$$

This is all from the “desired” area. This is how our logic works. Logic leads us to this. This is the result of our logical reflections and generalizations. This is how it should be. Everything is subject to logic, but nature itself is logical! These systems of equalities (5) and (5') express the relations between the systems SI{kg, CUE, m, s} and the extended (by

adding the unit EUE) system of elementary units of nature (SEEP) ESU{MAM, EUE, EUL, EUT }. This is a somewhat “modernized” SI due to the introduction of a new unit (CUE) for elementary charge (EUE). This is the corrected SI, instead of the electricity unit of the coulomb (C), the unit of “generalized coulomb” CUE is used. We also remember our convention that the identity holds: EUE  $\equiv$  e.

But what do we actually have? We could add to systems (3) and (3') a line dedicated to the elementary electric charge (electron charge, e) and its unit C (coulomb), as is actually the case in the theory of modern physics (TMP). But we could in systems (5) and (5') make the same substitution with respect to the second equalities. As a result, we would get the following system:

$$\begin{cases} 1 \text{ kg} = \alpha^{-1} \cdot \{c\} \text{ MAM} \\ 1 \text{ C} = 6,241\,509\,0745 \cdot 10^{18} \text{ e} \\ 1 \text{ m} = \alpha^{-1} \cdot \{c\}^3 \cdot \{G\}^{-1} \text{ EUL} \\ 1 \text{ s} = \alpha^{-1} \cdot \{c\}^4 \cdot \{G\}^{-1} \text{ EUT} \end{cases} \quad (3B'')$$

and the reverse system:

$$\begin{cases} 1 \text{ MAM} = \alpha \cdot \{c\}^{-1} \text{ kg} \\ 1 \text{ e} = 1,602\,176\,6208 \cdot 10^{-19} \text{ C} \\ 1 \text{ EUL} = \alpha \cdot \{c\}^{-3} \cdot \{G\} \text{ m} \\ 1 \text{ EUT} = \alpha \cdot \{c\}^{-4} \cdot \{G\} \text{ s} \end{cases} \quad (3B''')$$

These systems express the relations between the system of units SI{kg, C (coulomb), m, s} and the system of elementary units of nature (SEUN) ESU{MAM, EUE (e), EUL, EUT}. But the logic of constructing these systems is violated by the second equalities.

What do we need to do to establish complete identity between systems (5) and (3B'') and, accordingly, between systems (5') and (3B''')? The answer is simple and clear: we need to establish a correspondence between two numerical values:

$$\{e\} = 1,602\,176\,6208 \cdot 10^{-19} \text{ и}$$

$$\alpha \cdot \text{UCN}^{-0,5}.$$

In this case  $e = 1,602\ 176\ 6208 \cdot 10^{-19}$  C is the value of the elementary electric charge (electron charge) in SI{kg, C, m, s}.

$\text{EUE} = \alpha \cdot \text{UCN}^{-0,5}$   $\text{CUE} = 6,633\ 257\ 4552 \cdot 10^{-25}$  CUE is the value of the elementary electric charge (electron charge) in the SI{kg, CUE, m, s} system.

As is known from the theory of modern physics (TMP):

$e = 1,602\ 176\ 6208 \cdot 10^{-19}$  C is the electron charge in SI{kg, C, m, s} .

The reverse ratio will be:

$$C = \{e\}^{-1} e = (1,602\ 176\ 6340 \cdot 10^{-19})^{-1} e = 6,241\ 509\ 0745 \cdot 10^{18} e.$$

This is the charge of the coulomb (C) in the units of elementary electric charge (e).

It is also known from TMP that

$$M_{\text{Pl}} = 6,524\ 784\ 9854 \frac{\text{kg}\cdot\text{m}}{\text{s}} - \text{Planck momentum.}$$

Within the framework of the “Theory of Nature” the following relations are established:

$$\text{UCN}^{-0,5} = 9,089\ 949\ 1966 \cdot 10^{-23},$$

$$\frac{\{e\}}{(\alpha^{-0,5} \cdot 10^{3,5} \cdot \{M_{\text{Pl}}\})} = \alpha \cdot \text{UCN}^{-0,5} = 6,633\ 257\ 4552 \cdot 10^{-25}.$$

The last equality shows how the transition from the elementary charge unit in coulombs (this is the numerical value {e}) to its EUE representation in CUE units (this is the numerical value {e}/( $\alpha^{-0,5} \cdot 10^{3,5} \cdot \{M_{\text{Pl}}\}$ )).

We believe that  $e \equiv \text{EUE}$ , i.e. these are two designations for an elementary charge: e is the designation adopted in the theory of modern physics (TMP), and EUE is the designation adopted in the “Theory of Nature” (TN).

While the equalities take place:

$$e = 1,602\ 176\ 6208 \cdot 10^{-19} \text{ C or}$$

$$\text{EUE} = \alpha \cdot \text{UCN}^{-0,5} \text{ CUE} \equiv 6,633\ 257\ 4552 \cdot 10^{-25} \text{ CUE,}$$

the following equality also takes place:

$$EUE = \frac{\{e\}}{(\alpha^{-0,5} \cdot 10^{3,5} \cdot \{M_{PI}\})} CUE = 6,633\ 257\ 4552 \cdot 10^{-25} CUE.$$

### Step fourteen.

We need to take one more step forward.

This step should lead us to an even simpler, clearer and more understandable understanding of the world, an understanding of the foundations of nature and the universe.

Carefully considering the systems of equalities (5) and (5'), expressing the dependencies between the system of units SI{kg, CUE, m, s} and the system of elementary units of nature (SEUN) ESU{MAM, EUE, EUL, EUT}, we see the presence FSC multiplier in the form  $\alpha$  or  $\alpha^{-1}$  in the right parts of all equalities of systems (5) and (5'). If we now move from the SI{kg, CUE, m, s} system to the proportional system of units  $\alpha$ -SI{ $\alpha$  kg,  $\alpha$  CUE,  $\alpha$  m,  $\alpha$  s} (or  $\alpha$ -SI{ $\alpha$ -kg,  $\alpha$ -CUE,  $\alpha$ -m,  $\alpha$ -s}, which is the same) with the coefficient of proportionality  $\alpha$  (FSC), then the factors  $\alpha$  or  $\alpha^{-1}$  will disappear in the right parts of all equalities. At the same time, we will make the following renamings simultaneously and immediately:

$$\alpha\text{-kg}=\alpha \text{ kg}=\text{NAM} - \text{natural unit of mass},$$

$$\alpha\text{-CUE}=\alpha \text{ CUE}=\text{NUE} - \text{natural unit of electric charge},$$

$$\alpha\text{-m}=\alpha \text{ m}=\text{NUL} - \text{natural unit of length},$$

$$\alpha\text{-s}=\alpha \text{ s}=\text{NUT} - \text{natural unit of time}.$$

As a result of all this, we get the following systems of equalities, identities:

$$\left\{ \begin{array}{l} \text{NAM} = \{G\}^{0,25} \cdot \text{UCN}^{0,25} \text{MAM} \\ \text{NUE} = \text{UCN}^{0,5} \text{EUE} \\ \text{NUL} = \{G\}^{-0,25} \cdot \text{UCN}^{0,75} \text{EUL} \\ \text{NUT} = \text{UCN} \text{EUT} \end{array} \right. \quad (6)$$

and reverse system:

$$\begin{cases} 1 \text{ MAM} = \{G\}^{-0,25} \cdot \text{UCN}^{-0,25} \text{ NAM} \\ 1 \text{ EUE} = \text{UCN}^{-0,5} \text{ NUE} \\ 1 \text{ EUL} = \{G\}^{0,25} \cdot \text{UCN}^{-0,75} \text{ NUL} \\ 1 \text{ EUT} = \text{UCN}^{-1} \text{ NUT} \end{cases} \quad (6')$$

This system of units, the system of natural units of nature (SNUN) NSU {NAM, NUE, NUL, NUT} will be an alternative system for SI.

The  $\alpha$ -SI { $\alpha$  kg,  $\alpha$  CUE,  $\alpha$  m,  $\alpha$  s} system (or  $\alpha$ -SI { $\alpha$ -kg,  $\alpha$ -CUE,  $\alpha$ -m,  $\alpha$ -s}, which is the same) is different (equivalent) designation for our (alternative to SI) system of units (SNUN) NSU {NAM, NUE, NUL, NUT}.

In numerical values, the systems of equalities (6) and (6') will be represented as follows:

$$\begin{cases} 1 \alpha \text{ kg} = 1 \text{ NAM} = 2,997 \ 924 \ 5800 \cdot 10^8 \text{ MAM} \\ 1 \alpha \text{ CUE} = 1 \text{ NUE} = 1,100 \ 116 \ 1595 \cdot 10^{22} \text{ EUE} \\ 1 \alpha \text{ m} = 1 \text{ NUL} = 4,036 \ 978 \ 0228 \cdot 10^{35} \text{ EUL} \\ 1 \alpha \text{ s} = 1 \text{ NUT} = 1,210 \ 255 \ 5643 \cdot 10^{44} \text{ EUT} \end{cases} \quad (6A)$$

and so

$$\begin{cases} 1 \text{ MAM} = 3,335 \ 640 \ 9520 \cdot 10^{-9} \text{ NAM} (\alpha \text{ kg}) \\ 1 \text{ EUE} = 9,089 \ 949 \ 1966 \cdot 10^{-23} \text{ NUE} (\alpha \text{ CUE}) \\ 1 \text{ EUL} = 2,477 \ 100 \ 4310 \cdot 10^{-36} \text{ NUL} (\alpha \text{ m}) \\ 1 \text{ EUT} = 8,262 \ 717 \ 6397 \cdot 10^{-45} \text{ NUT} (\alpha \text{ s}) \end{cases} \quad (6A')$$

But the units that form a system of elementary units of nature (mass, electric charge, length and time) are such units MAM, EUE, EUL, EUT. These are quanta of mass, electric charge, length and time, respectively. The relationship between the elementary units of nature (quanta units) that form the ESU system of units and the natural units of nature that form the NSU system of units is presented in systems (6) and (6').

So, regarding the elementary charge, the electron charge ( $e$ ), the elementary charge quantum (EUE) (which is the same!) and their generalized units, we have such important information:

$$1 \text{ C} = 6,241\,509\,0745 \cdot 10^{18} \text{ e},$$

$$e = 1,602\,176\,6208 \cdot 10^{-19} \text{ C};$$

$$1 \text{ CUE} = \alpha^{-1} \cdot \text{UCN}^{0,5} \text{ EUE} = 1,507\,555\,1702 \cdot 10^{24} \text{ EUE},$$

$$1 \text{ EUE} = \alpha \cdot \text{UCN}^{-0,5} \text{ CUE} = 6,633\,256\,4127 \cdot 10^{-25} \text{ CUE};$$

$$1 \text{ NUE} = \text{UCN}^{0,5} \text{ EUE} = 1,100\,116\,1595 \cdot 10^{22} \text{ EUE},$$

$$1 \text{ EUE} = \text{UCN}^{-0,5} \text{ NUE} = 9,089\,949\,1966 \cdot 10^{-23} \text{ NUE}.$$

It should be noted that both the system of units SI {kg, C(coulomb), m, s} and the system of elementary units of nature ESU {MAM, EUE, EUL, EUT} have real prototypes (artifacts) in nature.

But there is also a very significant difference between them.

The SI units and their corresponding prototypes (artifacts) in nature, in the general case, are arbitrarily chosen by man.

As for the units of the ESU system, the prototypes of the units of this system in nature are the fundamental characteristics of nature itself.

These characteristics are the properties of a grain of matter. A grain of matter (like a material body!) is the material carrier of these standard values, these prototypes.

At the same time, as established in the “Theory of Nature”, in nature itself there is a material “first brick”, this is a quantum of matter, as the minimum amount of matter in nature, and as a material body. Matter is primary. The matter of nature is represented by quanta of matter. These are the minimum material formations in nature. Quanta of matter are in constant motion. A quantum of matter, as a material body, is a material body pulsating in the rhythm and pace of nature. A quantum of matter is a pulsating material flesh. The process of pulsation is an internal process of

motion of matter, a quantum of matter. This is a strictly periodic, harmonic process that occurs in the rhythm and pace of nature. The lower limit of the pulsation of a quantum of matter is a grain of matter.

The matter of a grain of matter is a quantum of matter. And the quantum of time is identical, homogeneous quantity for the quantum of matter. The quantum of an elementary electric charge is the square root of the quantum of matter. All of these are constants.

The diameter of a grain of matter is a quantum of length. The mass of a grain of matter is a quantum of mass. These last two quantities (quantum of length and quantum of mass) are variable quantities. They change with the time of nature (universal time) according to the corresponding algorithm. This algorithm is found and defined in the “Theory of Nature”. This is the law of nature.

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## **Part II.**

Within the framework of TP, the material “first brick” of the foundations of nature, the universe, is defined, this is a quantum of matter. Strictly periodic, harmonic process of matter quantum pulsation occurs in the rhythm and pace of nature. In the process of quantum of matter pulsation, the final lower and upper limits of pulsation are reached. The lower limit of matter quantum pulsation is a grain of matter. This is one, single, equal limit for all quanta of matter. All grains of matter have the same size, the same length of diameter. The upper limit of quantum of matter pulsation is a fundamental (elementary) particle. These are the upper final limits of the pulsation of the quantum of matter, different in size (length) of the diameter. The type of a fundamental (elementary) particle (electron, proton, neutron, etc.) is determined by the size of the diameter of a quantum of matter in its upper limit of pulsation. This is the defining feature of a fundamental (elementary) particle.

In its limiting (lower and upper) states (hypostases) the quantum of matter stays for some time, different from zero. The existence of a grain of matter is a certain moment, a moment in the existence of a quantum of matter. Similarly, the existence of a fundamental (elementary) particle is also some other moment, a moment in the existence of a quantum of matter. While the existence of a quantum of matter is a continuous process (like a continuous line), the existence of a grain of matter and the existence of a fundamental (elementary) particle are discontinuous processes (like a dotted line). The existence of a quantum of matter is real, absolutely, continuous, primary. And the existence of a grain of matter and the existence of a fundamental (elementary) particle is also real, absolute, but discontinuous and secondary. The state (hypostasis) of a “grain of matter” and the state (hypostasis) of a “fundamental (elementary) particle” are purely opposite states (hypostases) in the ongoing pulsating process of the existence of a quantum of matter. These are alternating states.

The quantum of matter, as a whole, is also in constant external movement, displacement. This is a movement per quantum of length per quantum of

time. But this is the maximum in nature the speed of movement of material bodies, quanta of matter. The quantum of matter is, first of all, the minimum amount of matter in nature. Matter is primary in nature. It is this matter that gives rise to a material body - a quantum of matter. The quantum of matter is one in the sense that (1) it is the minimum amount of matter in nature and (2) it is a material body. A quantum of matter pulsating in the rhythm of nature underlies all fundamental (elementary) particles. With this in mind (as primary!), we can on this basis speak of fundamental (elementary) particles pulsating in the rhythm of nature (as secondary!). In this case, the lower limit of the pulsation of fundamental (elementary) particles will also be a grain of matter.

A grain of matter is a material carrier of the natural elementary characteristics of nature. These are characteristics such as quanta of matter (EUM), time (EUT), length (EUL), mass (MAM), elementary electric charge, electron charge (EUE).

The philosophy of nature, the philosophy of the foundations of nature, is a dialectical-materialist philosophy.

The logic of the structure of the foundations of nature, the foundations of the universe is dialectical-materialistic logic.

Everything in nature is based on matter, moving matter.

The qualitative side of any phenomenon in nature has its own quantitative characteristic, evaluation.

All the basic, fundamental quantitative assessments in the foundations of nature, the universe, in the foundations of the Universe are connected in one way or another with a unique constant of nature, discovered and established within the framework of the "Theory of Nature". Here is the constant:

$$\text{UCN} = 1,210\,255\,5643 \cdot 10^{44}.$$

The reciprocal value is:

$$\text{UCN}^{-1} = 8,262\,717\,6397 \cdot 10^{-45}.$$

We will consider this a kind of beginning of our further narration, reasoning about the foundations of nature, the universe.

Further, we will give equalities of a similar type, where the left side is the qualitative side, and the right side is the quantitative side, the estimate. In this case, we will also indicate the unit of another physical quantity taken as a basis, as is customary in metrology and dimensional theory.

The definition of a quantum of matter will be as follows:

$$\text{EUM} = \text{UCN}^{-1}\text{NUM},$$

where UCN is a unique constant of nature, NUM is a natural unit of matter, the existence of which we postulate in nature. Within the framework of the TN (“Theory of Nature”), a complete dialectical-materialistic, strictly logical explanation (substantiation) of this assumption about the existence of NUM is given. As for the unique constant of nature UCN and its meaning, then, in fact, this is also postulated within the framework of the “Theory of Nature”:

$$\text{UCN} = 1,210\,255\,5643 \cdot 10^{44}.$$

If we take as a basis the definition of a quantum of matter presented above, then the consequence will be this equality (the definition of a natural unit of matter):

$$\text{NUM} = \text{UCN} \text{EUM}.$$

But this is understandable. One physical quantity is expressed linearly in terms of another physical quantity and the corresponding numerical coefficient. But then the inverse relation will be a linear expression:

$$\text{EUM} = \text{UCN}^{-1} \text{NUM}.$$

This is completely understandable. This is a mutually inverse and one-to-one relationship of two homogeneous physical quantities. The concept of a physical quantity is a basic concept in physics.

Within the framework of the TN, the natural system of nature units (NSU) and the elementary system of nature units (ESU) are considered in parallel. This is natural, logical and completely understandable.

Within the framework of the TN, the “Sixth problem of D. Hilbert”, the problem of the axiomatic construction of the foundations of physics, is solved simply, elegantly and gracefully, logically strictly and consistently. This problem was pointed out by the German mathematician D. Hilbert in 1900. The beginning of this Axiomatic construction of the foundations of physics is presented in tabular form (see Table 8). This is the first step in the axiomatic construction of the foundations of physics. It is worth carefully studying Table 8 and comments, notes to it.

Table 8 shows the first 6 basic physical quantities that lie (should lie!) in the foundations of physics.

The solution of a fundamental problem, the problem of the axiomatic construction of the foundations of physics, is undoubtedly worthy of the Nobel Prize in physics. This solution was found 10 years ago. E-mails with a notification and a detailed description of the solution to this problem were sent to thousands of addresses of modern leading physicists, the Physical Sciences Department of the Russian Academy of Sciences, institutes, departments, faculties. Articles on the solution of the problem of the Axiomatic construction of the foundations of physics were sent to almost all editorial boards of physical journals of the modern bourgeois Russian Federation. All responses were either negative or null (i.e. no response). No wonder. Modern reaction and obscurantism have filled all the niches in the power structures of the modern physical community. The degradation of physics as a science has reached the bottom, and the tyranny of physical power has reached unprecedented heights. The party of modern physicists has degenerated into a party of tyrants and assholes. But back to Table 8.

Table 8

## Definitions of primary fundamental physical quantities

№	Name	Natural quantity	Quantum quantity, elementary quantity
1	unique constant of nature	$UCN = 1,210\ 255\ 5643 \cdot 10^{44}$ $UCN = 1,210\ 255\ 5643 \cdot 10^{44}$	$UCN^{-1} = 8,262\ 717\ 6397 \cdot 10^{-45}$ $UCN^{-1} = 8,262\ 717\ 6397 \cdot 10^{-45}$
2	matter	$NUM = UCN\ EUM$ $NUM = UCN\ EUM$	$EUM = UCN^{-1} NUM$ $EUM = UCN^{-1} NUM$
3	time	$NUT \equiv NUM$ $NUT = UCN\ EUT$	$EUT \equiv EUM$ $EUT = UCN^{-1} NUT$
4	elementary electric charge	$NUE \equiv NUM^{0,5}$ $NUE \equiv UCN^{0,5} EUM^{0,5}$ $NUE \equiv UCN^{0,5} EUE$	$EUE \equiv EUM^{0,5}$ $EUE \equiv UCN^{-0,5} NUM^{0,5}$ $EUE \equiv UCN^{-0,5} NUE$
5	length	$NUL(A) \equiv \{A\}^{-0,125} \cdot UCN^{0,875} \uparrow EUL(A)$ $UCN \geq \{NUL(A)\} \geq UCN^{0,75}$	$\uparrow EUL(A) \equiv \{A\}^{0,125} \cdot EUM^{0,875}$ $\uparrow EUL(A) \equiv \{A\}^{0,125} \cdot UCN^{-0,875} NUM$ $\uparrow EUL(A) \equiv \{A\}^{0,125} \cdot UCN^{-0,875} NUL(A)$ $\uparrow \{EUL(A)\} = \{A\}^{0,125} \cdot UCN^{-0,875}$ $UCN^{-1} \leq \{EUL(A)\} \leq UCN^{-0,75}$
6	mass	$NAM(A) \equiv \{A\}^{0,125} \cdot UCN^{0,125} \downarrow MAM(A)$ $1 \leq \{NAM(A)\} \leq UCN^{0,25}$	$MAM \equiv \frac{EUM}{EUL}$ $\downarrow MAM(A) \equiv A^{-0,125} \cdot EUM^{0,125}$ $\downarrow MAM(A) = \{A\}^{-0,125} \cdot UCN^{-0,125} NAM$ $\downarrow \{MAM(A)\} = \{A\}^{-0,125} \cdot UCN^{-0,125}$ $1 \geq \{MAM(A)\} \geq UCN^{-0,25}$

Notes. The ratios highlighted in green represent the main postulates of the “Theory of Nature”. Six expressions, formulas, identities are presented that

define the main physical quantities: the unique constant of nature (UCN), the quantum of matter (EUM), the quantum of time (EUT), the quantum of elementary electric charge, the electron charge (EUE), the quantum of length (EUL), the quantum mass (MAM).

The author came to the definition of the physical quantity the unique constant of nature (UCN) as a result of a dialectical-materialistic analysis of the systems of equalities (3) and (3'), when in these expressions explicitly was allocated the quantity  $UCN \equiv \{c\}^4 \cdot \{G\}^{-1}$ . This is explicitly represented in systems (3'') and (3'''), as well as in systems (5) and (5').

The ratios highlighted in blue, the expressions in Table 8 are pairwise ratios between natural and elementary (quantum) units of the corresponding physical quantities (PQ). These are six pairs of FQ. For the physical quantities of length and mass, the limits of change of these quantities during the evolution of the Universe are indicated. The time of evolution of the Universe (A) in units of NUT, as established in the TN, lies within the limits:  $UCN^{-1} \leq \{A\} \leq UCN$ .

Note that the defining formula for the mass quantum  $MAM \equiv \frac{EUM}{EUL}$  is equivalent to the expression  $IMP = \frac{MAM \cdot EUL}{EUT} \equiv 1$ , stating the fact that the physical quantity momentum (IMP) is a dimensionless quantity, identically equal to one. Due to this identity defining the quantum of mass ( $MAM \equiv \frac{EUM}{EUL}$ ), the physical quantity of the quantum of mass (MAM) can be considered as a derived physical quantity. A similar remark can be made with regard to the quantum of time, the defining formula for which looks like this  $EUT \equiv EUM$ . Let's take note of this.

Relative to the physical quantity, the natural unit of length  $NUL(A)$  ( $NUL(A) \equiv \{A\}^{-0,125} \cdot UCN^{0,875} \uparrow EUL(A)$ ) such an explanation should be made. This physical quantity is constant in time, independent of the universal time (A), a physical quantity equal to  $\alpha$  m. But its unit, and this is the quantum of length  $[NUL(A)]=(EUL(A))$  and its numerical value

{NUL(A)} are variables. But their product throughout the whole evolution of the Universe remains a constant value:

$$\text{NUL}(A) \equiv \{A\}^{-0,125} \cdot \text{UCN}^{0,875} \uparrow \text{EUL}(A) \equiv \alpha \text{ m} \equiv \text{const.}$$

The same, similar remark applies to the physical quantity natural unit of mass NAM(A):

$$\text{NAM}(A) \equiv \{A\}^{0,125} \cdot \text{UCN}^{0,125} \downarrow \text{MAM}(A) \equiv \alpha \text{ kg} \equiv \text{const.}$$

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Now we have to take the second step in the axiomatic construction of the foundations of physics.

At this second step, it is necessary to determine three more important fundamental physical quantities and show their connection with the corresponding physical quantities in the theory of modern physics (TMP). These quantities are the fundamental characteristics of the Universe (nature). The first physical quantity is the maximum velocity (speed) in nature (in the Universe), MVN. For the current age of the Universe, this value (MVN) corresponds to the physical value of the speed of light in vacuum (c). The second physical quantity is the gravitational quantity of the Universe (GVU). For the present age of the Universe, this quantity (GVU) corresponds to the physical quantity Newton's gravitational constant (G). Both physical quantities MVN and GVU reflect the most important fundamental characteristics of the Universe. Both of these physical quantities are increasing physical quantities. The third physical quantity that we will define in this step is the physical quantity momentum (IMP).

The value of this quantity in the elementary system of units will be a dimensionless unit ( $\text{IMP} \equiv \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1$ ). This is a fundamental law of nature, the law of interrelation (interdependence) of quanta of length, mass and time. These quanta are not independent characteristics of nature. At



the same time, on the other hand, in the SI unit system, the numerical value of this momentum is equal to the value of the fine structure constant ( $\alpha$ ):  $\text{IMP} \equiv \alpha \frac{\text{kg m}}{\text{s}}$ . This is the most important assumption of the author of the “Theory of Nature”. This assumption, hypothesis arose within the framework of the author's dialectical materialistic understanding of the problem of representing the physical quantity momentum (IMP) in the SI system.

Equating the right-hand sides of the last two identities with the PQ momentum (IMP) on the left-hand side, we get the third identity:

$$\alpha \frac{\text{kg m}}{\text{s}} \equiv 1.$$

From this follow two consequences:

$$\alpha^{-1} \equiv 1 \frac{\text{kg m}}{\text{s}} \text{ or } \alpha^{-1} \equiv \frac{\text{kg m}}{\text{s}}$$

and

$$\alpha \equiv 1 \frac{\text{s}}{\text{kg m}} \text{ or } \alpha \equiv \frac{\text{s}}{\text{kg m}}.$$

The formula  $\alpha \equiv \frac{\text{s}}{\text{kg m}}$  is the defining identity for the physical dimensionless quantity fine structure constant (FSC). The same formula shows how the physical quantities (units) SI 1 kg, 1 m, 1 s are related. These quantities, these units are not independent quantities. They are collectively dependent. And the reflection of their dependence is the fine structure constant. The problem of the fine structure constant is solved within the framework of the “Theory of Nature”. Here is her simple solution:  $\alpha \equiv \frac{\text{s}}{\text{kg m}}$ . Damn it, but this solution to the fundamental problem of physics (the problem of the fine structure constant) is worthy of the Nobel Prize in physics! But the solution of the  $\text{IMP} \equiv \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1$  problem, of course, also “pulls” for the Nobel Prize in physics. Dear Nobel Committee, wake up, wake up and pay attention! A queue of worthy

solved fundamental problems on the basics of physics and cosmogony (cosmology) has formed for you.

The fractional expression  $\frac{s}{\text{kg m}}$  is a non-dimensional physical quantity and equal to the numerical value of the FSC ( $\alpha$ ). In this case, we can write:

$$\alpha \equiv 1 \frac{s}{\text{kg m}}, \alpha \equiv 1 \alpha \equiv 1 \cdot \alpha \equiv \alpha.$$

It is worth paying attention to the following identities:

$$1 \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1 \quad 1 \equiv 1 - \text{dimensionless } 1,$$

$$1 \frac{\text{kg m}}{s} \equiv \alpha^{-1} \quad 1 \equiv \alpha^{-1} - \text{dimensionless numerical value } \alpha^{-1},$$

$$1 \frac{s}{\text{kg m}} \equiv \alpha \quad 1 \equiv \alpha - \text{dimensionless numerical value } \alpha \text{ (FSC)}.$$

The left parts of these three identities are dimensional 1, i.e. dimensional physical quantities with a numerical part (numerical coefficient) equal to 1. The right parts of all these three identities are dimensionless numerical quantities. The middle parts of these identities represent the physical quantity in an explicit form, indicating its numerical value and its dimension equal to 1, and this latter means the dimensionlessness of the physical quantity. The indication of dimensionlessness can be omitted, and then the right-hand sides of the identities will be obtained. The first two identities are hypotheses, assumptions of the author of the TN. The third identity is simply a consequence of the second.

Table 9

## Four fundamental physical quantities

№	Name	Defining formula	Correspondence to the modern age of the Universe
1	maximum velocity in the nature, in the Universe (MVN)	$\text{MVN}(A) \equiv \frac{\text{EUL}}{\text{EUT}}$ $\uparrow \text{MVN}(A) \equiv A^{0,125} \cdot \text{EUM}^{-0,125}$ $\uparrow \{\text{MVN}(A)\} = \{A\}^{0,125} \cdot \text{UCN}^{0,125}$	$\{\text{MVN}(A)\} = \{c\}$
2	gravitational quantity of the Universe (GVU)	$\text{GVU}(A) \equiv \frac{\text{EUL}^3}{\text{MAM} \cdot \text{EUT}^2}$ $\uparrow \text{GVU}(A) = A^{0,5} \cdot \text{EUM}^{0,5}$ $\uparrow \{\text{GVU}(A)\} = \{A\}^{0,5} \cdot \text{UCN}^{-0,5}$	$\{\text{GVU}(A)\} = \{G\}$
3	momentum (IMP)	$\text{IMP} \equiv \frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1$	$\text{IMP} \equiv \alpha \frac{\text{kg} \cdot \text{m}}{\text{s}} \equiv 1 *$
4	invariant of nature, the Universe	$\text{MVN}^{-4} \cdot \text{GVU} \cdot \text{IMP} \equiv \text{EUT}$	$c^{-4} \cdot G \cdot \text{IMP} \equiv \text{EUT} **)$ $\{c\}^{-4} \cdot \{G\} \cdot \alpha s \equiv \text{EUT}$ $\alpha s \equiv \{c\}^4 \cdot \{G\}^{-1} \text{EUT}$ $1 s \equiv \alpha^{-1} \cdot \{c\}^4 \cdot \{G\}^{-1} \text{EUT}$

Notes. Explanations.

\*) the column shows the defining formula (defining identity) for the physical quantity momentum (IMP) in the SI system of units. The numerical value of this quantity in SI is  $\{\text{IMP}\} = \alpha$ . The unit of dimension of the physical quantity momentum in SI will be the expression  $[\text{IMP}] = \frac{\text{kg} \cdot \text{m}}{\text{s}} \equiv \alpha^{-1}$ , which means dimensionless. But by its definition (hypothesis, assumption of the author of the TP), the physical quantity momentum (IMP) itself is dimensionless 1:  $\text{IMP} \equiv \alpha \frac{\text{kg} \cdot \text{m}}{\text{s}} \equiv \alpha \alpha^{-1} \equiv \alpha \cdot \alpha^{-1} \equiv 1$ .

\*\*\*) the graph contains expressions for the nature invariant in the SI system of units. The formula for the invariant of nature in SI leads us to the

physical quantity (PQ) quantum of time (EUT), expressed in terms of a second (a unit of time in SI). The value of ( $\alpha$  s) is the natural unit of time of nature (NUT). The value  $\{c\}^4 \cdot \{G\}^{-1}$  represents the unique constant of nature (of the Universe), UCN.

Each formula in this table (Table 9), as a solution to a specific fundamental problem in physics, is worthy of the Nobel Prize in Physics. This is a remark to the respected Nobel Committee.

Let us now consider the solution of another fundamental problem of physics and simultaneously and in parallel with cosmogony (cosmology). I mean the definition of the current universal time or the current age of the Universe. This decision is also presented in tabular form (see Table 10). Two fundamental physical formulas established within the framework of the “Theory of Nature” for physical quantities, the maximum velocity in nature (MVN) and the gravitational value (magnitude) of the Universe (GVU) are taken as a basis. Their defining formulas are presented in Table 9.

Table 10

Determination of the modern age of the Universe (two formulas)

Name of physical quantity	Designation	Defining formula. Calculation of the present age of the Universe	Unit
Universal absolute time, the absolute age of the Universe	A	$\{A\} = \{MVN\}^8 \cdot UCN^{-1}$ $\{MVN\} = \{c\}$ $\{A\} = \{c\}^8 \cdot UCN^{-1}$ $A = 5,391\ 238\ 3834 \cdot 10^{23} \text{ NUT}$ $A = 3,934\ 176\ 7269 \cdot 10^{21} \text{ s}$ $A = 1,246\ 665\ 37596 \cdot 10^{14} \text{ years}$	$\mu^4$
Universal absolute time, the absolute age of the Universe	A	$\{A\} = \{GVU\}^2 \cdot UCN$ $\{GVU\} = \{G\}$ $\{A\} = \{G\}^2 \cdot UCN$ $A = 5,391\ 238\ 3834 \cdot 10^{23} \text{ NUT}$ $A = 3,934\ 176\ 7269 \cdot 10^{21} \text{ s}$ $A = 1,246\ 665\ 37596 \cdot 10^{14} \text{ years}$	$\mu^4$

Note. The physical quantity A in units of NUT ( $\mu^4$ ) represents the absolute (modern) universal time or (which is the same) the absolute (modern) age of the Universe.

Ultimately, in both cases, the modern (current) absolute universal time or the modern (current) absolute age of the Universe, according to the “Theory of Nature”, is approximately equal to 124 trillion 666 billion 537 million 596 thousand years. A year in calculations is considered equal to 365.25 days. I will not fail to say that the solution of this fundamental problem is worthy of the Nobel Prize in physics and cosmogony (cosmology). Wake up, Nobel Committee!

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Probably, it would be correct to present in tabular form other results already presented in this article in the form of systems of equalities, identities. The tabular form will not interfere and will not be redundant. Minimal comments will be given on tables where appropriate.

Table 11

Definition of a unique constant of nature (the Universe)

Defined constant	Designation	Defining formula	Numeric value	Unit
unique constant of nature (the Universe)	UCN	$UCN \equiv \{F_{Pl}\}$	$1,210\ 255\ 5643 \cdot 10^{44}$	1
the reciprocal of UCN	$UCN^{-1}$	$(\{F_{Pl}\})^{-1}$	$8,262\ 717\ 6397 \cdot 10^{-45}$	1

Note.  $F_{Pl} = c^4 \cdot G^{-1}$  – Planck force.

Elementary units of nature (quanta)  
(defining formulas)

Name of physical quantity	Designation	Defining formula	Unit
quantum of matter	EUM	$EUM = UCN^{-1}$	$\mu^4$
quantum of time	EUT	$EUT \equiv EUM$	$\mu^4$
quantum of electric charge	EUE	$EUE \equiv \sqrt{EUM} \equiv EUM^{0,5}$ $\{EUE\} = UCN^{-0,5}$	$\mu^2$
quantum of length	EUL	$\uparrow EUL(A) \equiv A^{0,125} \cdot EUM^{0,875}$ $\uparrow \{EUL(A)\} = \{A\}^{0,125} \cdot UCN^{-0,875}$	$\mu^4$
quantum of mass	MAM	$MAM \equiv \frac{EUM}{EUL}$ $\downarrow MAM(A) \equiv A^{-0,125} \cdot EUM^{0,125}$ $\downarrow \{MAM(A)\} = \{A\}^{-0,125} \cdot UCN^{-0,125}$	1

Note. The universal absolute time or the absolute age of the Universe (A) in the formulas of this table is presented in natural units of time (NUT,  $\mu^4$ ). The defining formulas (identities) for the quantum of length and quantum of mass contain the physical quantity A (in NUT) – the current age of the Universe (it is also the current universal time). And if we learned from experience, experiment the actual (modern) numerical values of these quantum quantities (units), then we could determine the modern age of the Universe (and the modern universal time) using simple formulas. But we do not have these experimental data. We have no experimental data on the quantum of length or on the quantum of mass.

The physical quantity of a mass quantum turns out to be a dimensionless quantity.

Table 13

Elementary units of nature (quanta)  
(defining formulas in SI)

Name of physical quantity	Designation	Defining formula	Unit
quantum of matter	EUM	$\alpha \cdot \{G\} \cdot \{c\}^{-4} \equiv \alpha \cdot UCN^{-1}$	<b>X</b>
quantum of time	EUT	$\alpha \cdot \{G\} \cdot \{c\}^{-4} s \equiv \alpha \cdot UCN^{-1} s$	s
quantum of electric charge	EUE	$\alpha \cdot (\{G\} \cdot \{c\}^{-4})^{0,5} CUE \equiv$ $\alpha \cdot UCN^{-0,5} CUE$	CU E
quantum of length	EUL	$\alpha \cdot \{c\}^{-3} \cdot \{G\} m \equiv$ $\alpha \cdot G^{0,25} \cdot UCN^{-0,75} m$	m
quantum of mass	MAM	$\alpha \cdot \{c\}^{-1} kg \equiv \alpha \cdot G^{-0,25} \cdot$ $UCN^{-0,25} kg$	kg

Note. This table corresponds to the system of equalities (5').

Table 14

Numerical values of quantized quantities in SI  
for the current age of the Universe

Name of physical quantity	Designation	The numerical value of the quantity for the present age of the Universe	Unit
quantum of matter	EUM	$6,029\ 596\ 3798 \cdot 10^{-47}, \text{ const}$	<b>X</b>
quantum of time	EUT	$6,029\ 596\ 3798 \cdot 10^{-47}, \text{ const}$	s
quantum of electric charge	EUE	$6,633\ 256\ 4127 \cdot 10^{-25}, \text{ const}$	CU E
quantum of length	EUL	$1,807\ 627\ 5194 \cdot 10^{-38}$	m
quantum of mass	MAM	$2,434\ 134\ 8071 \cdot 10^{-11}$	kg

Note. Here are the numerical values of the physical quantities defined in Table 13. The values of the quantum quantities in this table are presented in the “refined and supplemented” system of units SI{kg, CUE, m, s}. The unit of electric charge CUE is a “refined, reduced or generalized” coulomb. This table corresponds to the system of equalities (5A').

The system of quantum quantities of mass, electric charge, length, time (=matter) is a system of elementary units of nature ESU{MAM, EUE, EUL, EUT}.



**X** - means that there is no such unit in SI. In SI there are no physical quantities quantum of matter (EUM) and natural unit of matter (NUM).

Table 15

SI units expressed in terms of elementary units of nature  
(quantum units)

Name of physical quantity	Designation	Defining formula	Unit
matter *)			<b>X</b>
second	s	$\alpha^{-1} \cdot \{G\}^{-1} \cdot \{c\}^4 \equiv \alpha^{-1} \cdot \text{UCN}$	EUT
quantum of electric charge	e, CUE	$\alpha^{-1} \cdot (\{G\}^{-1} \cdot \{c\}^4)^{0,5} \equiv \alpha^{-1} \cdot \text{UCN}^{0,5}$	EUE
length	m	$\alpha^{-1} \cdot G^{-0,25} \cdot (\{G\}^{-1} \cdot \{c\}^4)^{0,75} \equiv \alpha^{-1} \cdot G^{-0,25} \cdot \text{UCN}^{0,75}$	EUL
mass	kg	$\alpha^{-1} \cdot G^{0,25} \cdot (\{G\}^{-1} \cdot \{c\}^4)^{0,25} \equiv \alpha^{-1} \cdot G^{-0,25} \cdot \text{UCN}^{0,25}$	MAM

Note. This table is inverse to table 13. This table corresponds to the system of equalities (5). The SI system is presented here as a “refined and augmented” system of units SI {kg, CUE, m, s}. The unit of electric charge CUE is a “refined, reduced or generalized” coulomb. In SI, the elementary unit of electric charge (electron charge) is represented as follows:

$$1 e = 1,602\ 176\ 6208 \cdot 10^{-19} \text{ C.}$$

The inverse formula will be:

$$1 \text{ C} = 6,241\ 509\ 0745 \cdot 10^{18} e.$$

\*) **X** In the theory of modern physics (TMP) there is no physical quantity matter.

Table 16

Numerical values of SI units expressed in terms of elementary units of nature (quanta)

Name of physical quantity	Designation	The numerical value of the quantity	Unit
matter *)			X
second	s	$1,658\ 485\ 8041 \cdot 10^{46}$	EUT
quantum of electric charge	e, CUE	$1,507\ 555\ 1702 \cdot 10^{24}$	EUE
length	m	$5,532\ 113\ 1663 \cdot 10^{37}$	EUL
mass	kg	$4,108\ 235\ 9000 \cdot 10^{10}$	MAM

Notes. These are numerical values for the present age of the Universe. Numerical values for the physical quantities (units) of time and quantum of electric charge (electron charge) remain unchanged throughout the evolution of the Universe. But for the physical quantities 1 m (length) and 1 kg (mass), their units EUL and MAM and their numerical values are variable. All these units SI{kg, CUE, m, s} themselves remain constant throughout the whole evolution of the Universe. This table corresponds to the system of equalities (5A).

\*) X In the theory of modern physics (TSF) there is no physical quantity of matter.

Table 17

NSU Unit Values in ESU Units

Name of physical quantity	Designation	Defining formula and numerical values	Unit
natural unit of matter	NUM	$\text{NUM} = \text{UCN EUM}$ $1,210\ 255\ 5643 \cdot 10^{44}$	EUM
natural unit of time	NUT	$\text{NUT} = \text{UCN EUT}$ $1,210\ 255\ 5643 \cdot 10^{44}$	EUT
natural unit of electric charge	NUE	$\text{NUE} = \text{UCN}^{0,5} \text{EUE}$ $1,100\ 116\ 1595 \cdot 10^{22}$	EUE
natural unit of length	NUL	$\text{NUL} = \{G\}^{-0,25} \cdot \text{UCN}^{0,75} \text{EUL}$ $4,036\ 978\ 0228 \cdot 10^{35}$	EUL
natural unit of mass	NAM	$\text{NAM} = \{G\}^{0,25} \cdot \text{UCN}^{0,25} \text{MAM}$ $2,997\ 924\ 5800 \cdot 10^8$	MAM

Note. This table corresponds to the system of equalities (6) and (6A).

ESU unit values in NSU units

Name of physical quantity	Designation	Defining formula and numerical values	Unit
elementary unit of matter	EUM	$EUM = UCN^{-1} NUM$ $8,262\ 717\ 6397 \cdot 10^{-45}$	NUM
elementary unit of time	EUT	$EUT = UCN^{-1} NUT$ $8,262\ 717\ 6397 \cdot 10^{-45}$	NUT
elementary unit of electric charge	EUE	$EUE = UCN^{-0,5} NUE$ $9,089\ 949\ 1966 \cdot 10^{-23}$	NUE
elementary unit of length	EUL	$EUL = \{G\}^{0,25} \cdot UCN^{-0,75} NUL$ $2,477\ 100\ 4310 \cdot 10^{-36}$	NUL
elementary unit of mass	MAM	$MAM = \{G\}^{-0,25} \cdot UCN^{-0,25} NAM$ $3,335\ 640\ 9520 \cdot 10^{-9}$	NAM

Note. This table corresponds to the system of equalities (6') and (6A').

The ESU system of units is a system of quantum units  $ESU\{MAM, EUE, EUL, EUT\}$ . The NSU  $\{NAM, NUE, NUL, NUT\}$  system of units is the  $\alpha$ -SI  $\{\alpha\ kg, \alpha\ CUE, \alpha\ m, \alpha\ s\}$  system of units, it is an alternative to SI.

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It is necessary (I believe that this is extremely important and necessary) to make a few concluding, generalizing remarks on the entire “Theory of Nature”.

1). Within the framework of the TN, the problem of a specific representation of matter in nature is solved. This is, firstly, the content of fundamental (elementary) particles. This content is the “pure”, concrete matter of nature. This content is a quantum of matter. A quantum of matter is the smallest amount of matter in nature. And the quantum of matter at the same time is the material flesh pulsing in the rhythm and pace of nature. Secondly, the matter of nature is represented by material NUM-objects emitted by the Singularity, which decay into UCN quanta of matter. Thirdly, matter in nature is represented by material vacuum dust (MVD), which, according to the author of the TN, is a grain of matter in its final stage. And this is not a material particle pulsating in the rhythm and

pace of nature. This is a static matter, without internal movement (pulsation). But the material vacuum dust (MVP) is in external motion, it is moving towards the Singularity. The laws of this movement are yet to be understood. We also have to understand in detail how material vacuum dust is “packed” into material NUM-blocks using the Singularity mechanism.

2). Within the framework of the TN, the problem of the space of nature is solved. This is a negative decision. In nature, there is not, there is no space, as such, as some kind of natural entity.

3). Within the framework of the TN, the problem of the time of nature is solved. This is reflected in the following defining formulas for time:

EUT  $\equiv$  EUM – for a quantum of time through a quantum of matter,

NUT  $\equiv$  NUM – for the natural unit of time through the natural unit of matter.

4). Within the framework of the TN, the problem of the structure and evolution of the Universe is solved. This is a big conversation and a big topic. You should read the “Theory of Nature”.

5). Within the framework of TN, the problem of the fine structure constant (FSC) has been solved. Here is the solution in the form of a defining formula (identity):

$$\alpha \equiv \frac{s}{\text{kg m}}.$$

The fine structure constant (FSC) shows how the units of mass (1 kg), length (1 m), and time (1 s) are related in SI. It has already been said above that the relationship between the quantum of mass, the quantum of length and the quantum of time is established (postulated!) in the framework of the “Theory of Nature” by the identity:

$$\frac{\text{MAM} \cdot \text{EUL}}{\text{EUT}} \equiv 1.$$

This identity is equivalent to another identity:

$\frac{\text{MAM} \cdot \text{EUL}}{\text{EUM}} \equiv 1$ , because EUT  $\equiv$  EUM is the defining formula for time (quantum of time).

By the way, the defining formula for the mass quantum follows from here quite naturally and logically:

$$\text{MAM} \equiv \frac{\text{EUM}}{\text{EUL}}.$$

6). By establishing the defining formula for the quantum of mass, within the framework of the “Theory of Nature”, the fundamental problem of physics, the problem of mass, the problem of the connection between mass and matter, is solved.

Other important identities follow from the defining formula for the fine structure constant, for example:

$$\alpha \cdot \frac{\text{kg m}}{\text{s}} \equiv 1, 1 \frac{\text{kg m}}{\text{s}} \equiv \alpha^{-1}.$$

7). All fundamental problems solved within the framework of TN (and there are about 40 of them) are worthy of Nobel Prizes in physics and cosmology (cosmogony). And this is not hatred, not boasting, and not tyranny. This is a simple, clear and logical conclusion after a careful reading of the “Theory of Nature”. And tyranny, reaction and obscurantism in relation to the “Theory of Nature” over the past 10 years has been demonstrated by all physical power, power at all levels of the hierarchy, the entire physical army, the entire modern physical party, the entire modern physical community. This also includes all moderators and administrators (without exception) of the physical forums of the Runet network. This is the reality of our life.

8). “Theory of Nature” is a revolution in physics, cosmogony (cosmology), it is a revolution in natural science, it is a revolution in modern science. This Revolution is already 10 years old. But all these 10 years the party of modern physicists cannot and does not want to understand this. The party of modern physicists does not recognize TN and does not recognize the Revolution in physics accomplished by the “Theory of Nature”. The party of modern physicists is rightfully and essentially and in fact the party of asshole physicists. It's sad to admit. But this is a fact. And the facts must be considered. But the author of the “Theory of Nature” has no doubts that the following words are true with regard to the TN: “Our cause is just! The enemy will be defeated! Victory will be ours!” The future belongs to the “Theory of Nature”!

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So, in nature there are elementary units (quanta) of matter (EUM), mass (MAM), length (EUL), electric charge (EUE), time (EUT). The leading role belongs to matter, the quantum of matter. The quantum of time is defined as a physical quantity that is homogeneous and identically equal to the quantum of matter ( $EUT \equiv EUM$ ). It is stated, postulated the existence of a quantum of matter in the nature of the material body, as the “first brick” of the universe, nature. The pulsating nature of the existence of a quantum of matter is stated and postulated. This pulsation (internal movement of matter) is a strictly periodic, harmonic process, carried out in the rhythm and pace of nature. It is stated, postulated that the “pure” matter of nature in a minimum amount equal to the quantum of matter (EUM), generates the material body “quantum of matter”. Matter is primary! It is stated, postulated that the lower limit of matter quantum pulsation is a grain of matter. In the state of “grain of matter” quantum of matter stays for some time, different from zero. It is stated, postulated that a grain of matter is a material carrier of the reference units of nature – quanta of matter (EUM), time (EUT), electric charge (EUE), length (EUL) and mass (MAM), and the corresponding law of nature takes place, which in the terms of physical quantities looks like this:

$$\frac{MAM \cdot EUL}{EUM} \equiv 1 \text{ or so } \frac{MAM \cdot EUL}{EUT} \equiv 1.$$

Another law of nature connects electric charge and matter:

$EUE \equiv \sqrt{EUM}$  is the defining formula for the quantum of electric charge (electron charge) in the system of elementary units of nature (SEUN).

This is the initial stage in solving the fundamental problem, the problem of electric charge. There are still ambiguities, misunderstandings and unresolved issues. We need specifics, we need details. They are waiting for their explorers.

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That, perhaps, is all that I wanted to say about the alternative system of units for SI {kg, C, m, s}. This alternative to SI is the system of natural units of nature (SNUN) NSU {NAM, NUE, NUL, NUT}, also known as

the  $\alpha$ -SI $\{\alpha$ -kg,  $\alpha$ -CUE,  $\alpha$ -m,  $\alpha$ -s $\}$  system. This system of units is based on the system of elementary units of nature, the system of quantum quantities (units) ESU $\{MAM, EUE, EUL, EUT\}$ . All these questions are considered in the “Theory of Nature”. All these problems are solved within the framework of the TN. Solving these problems leads us to two systems of units.

These are the system of elementary units of nature (SEUN) ESU $\{MAM, EUL, EUT\}$ , and the system of enlarged units, the system of natural units of nature (SNUN) NSU $\{NAM, NUL, NUT\}$ . The last system of units is the alternative to SI.

Finishing touch. Last nail. Matter is primary in nature. And matter should be present as the main physical quantity in the conceptual apparatus of physics. But matter must also be present in the system of units. Therefore, it would be correct to make a clarification regarding the systems of units. This clarification concerns the indication of matter in a series of units. The systems of units should have five units, not four, and matter should be listed first. Therefore, our systems of units should still be represented as follows:

- 1) the system of elementary units of nature (SEUN) ESU  $\{EUM, EUT, EUL, EUE, MAM\}$ ,
- 2) the system of natural units of nature (SEUN) NSU $\{NUM, NUT, NUL, NUE, NAM\}$ .

It will be absolutely correct.

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PS Your\_manuscript RC10126 “My understanding of the phenomenon of gravity” by Robert Yusupov

and your\_manuscript RC10127 “Alternative to SI” by Robert Yusupov

Dear Dr. Yusupov,

Thank you for sending the above articles to be considered for publication in Reviews of Modern Physics. We have now discussed this among the RMP Editorial Board and are sorry to report that your papers are not suitable for RMP.

We would like to thank you for your interest in our journal and hope that you will find a different publication venue.

Yours sincerely,

Randall D. Kamien (he/him/his)

Lead Editor

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