Selection and Justification of a New Initial Level of the Material World

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Abstract

The work refers to the foundations of the material world, in particular—to the field of quantum physics associated with the initial level—his fundamental physical constants and elementary particles. The study of the initial levels of structuring of this formation is necessary for a better understanding of the foundations of the structure Universe. Therefore, the solution of these problems is an urgent and important task, to which the works of many scientists of the world are devoted, from ancient times to the present. However, these tasks have not yet been fully resolved. Their solution is the main goal and scientific novelty of the work performed. For this, **research methods** were used based on the general principles of deduction and movement from simple initial systems to more complex ones, which are substantiated by reliable physical laws. **The research results** are the choice and substantiation of the initial (zero) level of the material world and a system of fundamental physical constants and physical quantities found on their basis, which precede the 1st level—elementary particles. The problems of determining the wave parameters of the gravitational field and the unified of gravitational and electromagnetic fields of the Universe were solved only as a result of the transition to the zero level of the material world.

Keywords

Levels of Structuring of the Material World, Fundamental Physics Constants and Elementary Particles

1. Introduction

The work refers to the foundations of the material world, in particular—to the field of quantum physics, which precedes the level of elementary particles. The study of the initial levels of the universe is necessary for a better understanding

of the foundations of its structure, as the foundation of the universe. Therefore, the solution of these problems is an urgent and important task, to which the works of many scientists of the world are devoted, from ancient times [1] to the present time [2] [3]. However, these tasks have not yet been fully resolved.

Analysis of the state of the problem shows that at present, the initial levels of the material world include: 1st level—elementary particles, 2nd—nuclear, 3rd—atomic, etc., since each of them has its own physical laws. In [4], the initial 0-th level was added to them for the first time, preceding all the levels indicated above (**Figure 1**), which was called Planck's by the author of this work.

It was based on the fundamental physical constants (1) to (7), the values of which are recommended by CODATA [5]:

1) The speed of light in vacuum $c = 0.299792458(\text{exactly}) \times 10^9 \text{ m/s}$. (1)

2) Planck constant h (2), which is associated with the circular Planck constant $\hbar$ number 2π in the framework of dependence (3):

$$h = 6.626070040(81) \times 10^{-34} \text{ J} \cdot \text{s} = 6.626070040(81) \times 10^{-34} \text{ kg} \cdot \text{m}^2/\text{s} \quad (2)$$

$$\hbar = \frac{h}{2\pi} = \frac{6.626070040 \times 10^{-34} \left(\text{kg} \cdot \text{m}^2/\text{s}\right)}{2 \times 3.14159256} = 1.054571800 \times 10^{-34} \left(\text{kg} \cdot \text{m}^2/\text{s}\right) \quad (3)$$

3) Gravitational constant $G = 6.67408(31) \times 10^{-11} \text{ m}^3/\text{kg} \cdot \text{s}^2$. (4)

4) Electric constant $\varepsilon_0 = 8.854187817 \cdots \times 10^{-12} \text{ A}^2 \cdot \text{s}^4/\text{kg} \cdot \text{m}^3$, (5)

5) Magnetic constant $\mu_0 = 1/\left(\varepsilon_0 c^2\right) = 4\pi \times 10^{-7} \left(\text{N}/\text{A}^2\right)$, (6)

6) Thermal constant of Wines $b = 2.897756 \times 10^{-3} \left(\text{m} \cdot \text{K}\right)$. (7)

where single value: A is ampere, N is Newton, and K is degree of Kelvin.

Bringing this level to the original level of the material world has been justified by the fact that on the basis of the constants c, $\hbar$, G in 1900 M. Planck found the special units of measurement: this is length l_p (8), time t_p (9), and mass m_p, (10) [6]. Their feature of which was to obtain quantities with dimensions (m), (s), (kg) based on strict physical dependencies. This reduces them to absolute units
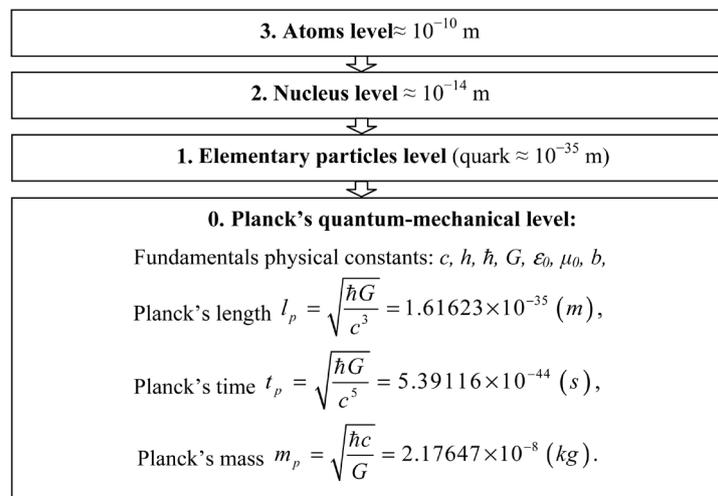
Figure 1. Quantum levels of material world (microcosm of Universe).

of measurement, the same in the entire Universe. They are recommended by CODATA also [5].

$$l_p = \sqrt{\frac{\hbar G}{c^3}} = 1.61623 \times 10^{-35} \, (\text{m}) \tag{8}$$

$$t_p = \sqrt{\frac{\hbar G}{c^5}} = 5.39116 \times 10^{-44} \, (\text{s}) \tag{9}$$

$$m_p = \sqrt{\frac{\hbar c}{G}} = 2.17647 \times 10^{-8} \, (\text{kg}) \tag{10}$$

On this basis, in [4], it was proposed to highlight this level into the initial (zero) Planck's level (Figure 1). However, its use in scientific research as a level preceding the Elementary particles level is associated with the problem of disharmony between the ratio of length (8) and time (9) to mass (10). For them, there are no analogues among all known elementary particles, including of theoretical developments for their preparation in the future. For example, their comparison with the size-mass parameters of the electron [5] [6] gives mutually opposite differences in the numerical values of the quantities: classical electron radius $r_e = 2.8179409 \times 10^{-15}$ m on 20 order of magnitude *more* than Planck's length $l_p = 1.61623 \times 10^{-35}$ m, and electron rest mass $m_e = 9.1093897 \times 10^{-31}$ kg on 23 order of magnitude *less* than Planck's mass $m_p = 2.17647 \times 10^{-8}$ kg. Therefore, in the framework of traditional knowledge of the material world, the use of the l_p, t_p, m_p values in scientific research is limited to the superdense (singular) period of the birth of the Universe and its Big Bang [7], as a result of which matter arose in the form of the initial physical fields and substances. In other cases, they are considered abstract quantities that is of found only by mathematical transformations to obtain their dimensions m, s, kg.

Therefore, it is necessary to eliminate the indicated disadvantages, in order to expand scientifically based knowledge about the material world at its initial (zero) quantum-mechanical level, which precedes the level of elementary particles. These are the main goal of the work performed.

2. Working Methods

This work is based on a method of studying the material world at its initial (zero) quantum-mechanical level, which precedes the levels of elementary particles, nuclei of atoms and the atoms themselves. The method is founded on the general principles of dialectics [8] and deduction, as a way of reasoning, in which a new position is deduced by a logical way from general provisions to particular conclusions.

3. Results of the Work and Their Discussion

The difference and scientific novelty of this work is the replacement of the initial (zero) level of the material world, which is associated with abstract parameters of length, time and mass by the real physical quantities of the material world.

To achieve the set goal, was used new fundamental physical constant—the frequency of the waves of the gravitational field $v_G \to 7.4 \times 10^{42}$ s^{-1}, which was found in 2013 in [9] and further developed in [10] [11] [12], on the basis of Planck's constant h (2) according to strict physical dependence (11):

$$v_G = \sqrt{\frac{c^5}{Gh}} = \sqrt{\frac{\left[0.299792458\times10^9\left(\text{m/s}\right)\right]^5}{6.67408\times10^{-11}\left(\text{m}^3/\text{kg}\cdot\text{s}^2\right)\times6.626070040\times10^{-34}\left(\text{kg}\cdot\text{m}^2/\text{s}\right)}} \quad (11)$$

$$= 7.39994\times10^{42}\left(\text{s}^{-1}\right) \to 7.4\times10^{42}\left(\text{s}^{-1}\right)$$

On the basis of the constant h, by analogy with the dependences (8) to (10), new Planck values of the length of time and mass (12)… (14) were also determined, which are not yet included in the CODATA list:

$$l_p = \sqrt{\frac{hG}{c^3}} = \sqrt{\frac{6.626070040\times10^{-34}\left(\text{kg}\cdot\text{m}^2/\text{s}\right)\times6.67408\times10^{-11}\left(\text{m}^3/\text{kg}\cdot\text{s}^2\right)}{\left[0.299792458\times10^9\left(\text{m/s}\right)\right]^3}} \quad (12)$$

$$= 4.05128\times10^{-35}\left(\text{m}\right)$$

$$t_p = \sqrt{\frac{hG}{c^5}} = \sqrt{\frac{6.626070040\times10^{-34}\left(\text{kg}\cdot\text{m}^2/\text{s}\right)\times6.67408\times10^{-11}\left(\text{m}^3/\text{kg}\cdot\text{s}^2\right)}{\left[0.299792458\times10^9\left(\text{m/s}\right)\right]^5}} \quad (13)$$

$$= 13.5136\times10^{-44}\left(\text{s}\right)$$

$$m_p = \sqrt{\frac{hc}{G}} = \sqrt{\frac{6.626070040\times10^{-34}\left(\text{kg}\cdot\text{m}^2/\text{s}\right)\times0.299792458\times10^9\left(\text{m/s}\right)}{6.67408\times10^{-11}\left(\text{m}^3/\text{kg}\cdot\text{s}^2\right)}} \quad (14)$$

$$= 5.45560\times10^{-8}\left(\text{kg}\right)$$

To distinguish Planck values (12) to (14) from circular (8) to (10), they are called linear, and the index in their designation is taken in uppercase (P), instead of lowercase (p).

In the works of M. Planck there is no constant v_G (11). To find it, it was necessary to change the direction of the train of thought to the opposite, which was not done, since M. Planck did not study the gravitational field and his goals were different to find the units of measurements: m, s, kg, which are universal for the entire material world.

The found constant obtained on the basis of strict physical dependence (11), which includes only real physical constants c, G, h. Therefore, denying the reality v_G is equivalent to denying the reality of these constants. She has the level of scientific discovery [13], therefore, by analogy with Planck's constant, it has every right to be called Nastasenko's constant by the name of its discoverer.

On the basis of the constant v_G (11), it is possible to replace the abstract value of the length with the real value of the wavelength λ_G of the gravitational field (15) and the abstract time with the value of the period T_G of oscillations of the waves of the gravitational field (16), which strictly follow from the wave laws of de Broglie [2]:

$$\lambda_G = \frac{c}{v_G} = \frac{0.299792458 \times 10^9 \, (\text{m/s})}{7.4 \times 10^{42} \, (\text{s}^{-1})} = 4.051249\,|\,432\,| \times 10^{-35} \, (\text{m}) \quad (15)$$

$$T_G = \frac{1}{v_G} = \frac{1}{7.4 \times 10^{42} \, (\text{s}^{-1})} = 0.135135135 \times 10^{-42} \, (\text{s}) = 0.\,|\,135\,| \times 10^{-42} \, (\text{s}) \quad (16)$$

It is also possible to obtain the real value of the mass m_G (17), which follows from the wave energy $E_G = h v_G$ of De Broglie law and the relationship between the mass and its total energy according to Einstein's law: $E = mc^2$ [2], which leads this mass to its energy equivalent:

$$m_G = \frac{E_G}{c^2} = \frac{h v_G}{c^2} = \frac{6.626070040 \times 10^{-34} \, (\text{kg} \cdot \text{m}^2/\text{s}) \times 7.4 \times 10^{42} \, (\text{s}^{-1})}{\left[0.299792458 \times 10^9 \, (\text{m/s})\right]^2} \quad (17)$$
$$= 5.455647896 \times 10^{-8} \, (\text{kg})$$

Only during the transition to the 0th level of the material world was it possible to determine the wave parameters of the gravitational field.

The found parameters (11), (15) to (17) are also wave characteristics of the Unified field of the Universe: $v_G = v_U$, $\lambda_G = \lambda_U$, $T_G = T_U$, $m_G = m_U$, which was first shown in [14] [15] [16] [17]. On a strict basis the connection between the frequencies $v_G = v_U$ and the unity of the gravitational and electromagnetic fields are given in [18] [19] in dependences (18) to (20), in which the frequencies v_U are included in the constant G characterizing the gravitational field, as well as in the constants c and h, characterizing the electromagnetic field:

$$G = \frac{c^5}{v_U^2 h} = \frac{\left[0.299792458 \times 10^9 \, (\text{m/s})\right]^5}{\left[7.4 \times 10^{42} \, (\text{s}^{-1})\right]^2 \times 6.626070040 \times 10^{-34} \, (\text{kg} \cdot \text{m}^2/\text{s})} \quad (18)$$
$$= 6.673969698 \times 10^{-11} \, (\text{m}^3/\text{kg} \cdot \text{s}^2)$$

$$h = \frac{c^5}{v_U^2 G} = \frac{\left[0.299792458 \times 10^9 \, (\text{m/s})\right]^5}{\left[7.4 \times 10^{42} \, (\text{s}^{-1})\right]^2 \times 6.673969698 \times 10^{-11} \, (\text{m}^3/\text{kg} \cdot \text{s}^2)} \quad (19)$$
$$= 6.626070040 \times 10^{-34} \, (\text{kg} \cdot \text{m}^2/\text{s})$$

$$c = \sqrt[5]{v_U^2 G h}$$
$$= \sqrt[5]{\left[7.4 \times 10^{42} \, (\text{s}^{-1})\right]^2 \times 6.673969698 \times 10^{-11} \, (\text{m}^3/\text{kg} \cdot \text{s}^2) \times 6.626070040 \times 10^{-34} \, (\text{kg} \cdot \text{m}^2/\text{s})} \quad (20)$$
$$= 0.299792458 \times 10^9 \, (\text{m/s})$$

Only during the transition to the 0th level of the material world was it possible to solve the problem of combining the gravitational and electromagnetic fields.

Further registration of the parameters $v_G = v_U$, $\lambda_G = \lambda_U$, $T_G = T_U$, $m_G = m_U$ in CODATA is planned.

Within the framework of dependencies (15) to (17), the found values of length, time and mass are not only real, but also calculated more accurately (up to 9 digits) than the original Planck values (12) to (14), based on fundamental physical constants c, h, G, which are obtained up to 5 digits.

By analogy with dependence (11), on the basis of the circular Planck constant ħ, the circular frequency of oscillations of the gravitational field waves ω_g was found, this the circular constant of Nastasenko (21):

$$\omega_g = \sqrt{\frac{c^5}{G\hbar}} = \sqrt{\frac{\left[0.299792458 \times 10^9 \, (\text{m/s})\right]^5}{6.67408 \times 10^{-11} \left(\text{m}^3/\text{kg} \cdot \text{s}^2\right) \times 1.05457266 \times 10^{-34} \left(\text{kg} \cdot \text{m}^2/\text{s}\right)}} \quad (21)$$

$$= 18.5489 \times 10^{42} \left(\text{s}^{-1}\right)$$

Taking into account the relationship between the constants h and $\hbar$ through the number 2π (3), the frequency ω_g can be refined up to 9 digits according to dependence (22):

$$\omega_g = \sqrt{2\pi v_G^2} = \sqrt{2\pi \times \left[7.4 \times 10^{42} \left(\text{s}^{-1}\right)\right]^2} = 18.5490492 \times 10^{42} \left(\text{s}^{-1}\right) \quad (22)$$

By analogy with (15) to (17), on the basis of the frequency ωg, with the same refinement up to 9 digits in comparison with the original 5 digits (8) to (10), new circular values: of length (23), time (24) and masse (25) can be obtained:

$$\lambda_g = \frac{c}{\omega_g} = \frac{0.299792458 \times 10^9 \, (\text{m/s})}{18.5490492 \times 10^{42} \left(\text{s}^{-1}\right)} = 1.61621469 \times 10^{-35} \, (\text{m}) \quad (23)$$

$$T_g = \frac{1}{\omega_g} = \frac{1}{18.5490492 \times 10^{42} \left(\text{s}^{-1}\right)} = 5.39111191 \times 10^{-42} \, (\text{s}) \quad (24)$$

$$m_g = \frac{E_g}{c^2} = \frac{\hbar \omega_g}{c^2} = \frac{1.05457266 \times 10^{-34} \left(\text{kg} \cdot \text{m}^2/\text{s}\right) \times 18.5490492 \times 10^{42} \left(\text{s}^{-1}\right)}{\left[0,299792458 \times 10^9 \, (\text{m/s})\right]^2} \quad (25)$$

$$= 2.17649040 \times 0^{-8} \, (\text{kg})$$

By analogy with the strict connection of the Unified field of the Universe with constants (18) to (20), its connection with the constant $\omega_g = \omega_u$ (26) to (28) is possible:

$$G = \frac{c^5}{\omega_U^2 \hbar} = \frac{\left[0.299792458 \times 10^9 \, (\text{m/s})\right]^5}{\left[18.5490492 \times 10^{42} \left(\text{s}^{-1}\right)\right]^2 \times 1.054571800 \times 10^{-34} \left(\text{kg} \cdot \text{m}^2/\text{s}\right)} \quad (26)$$

$$= 6.673969698 \times 10^{-11} \left(\text{m}^3/\text{kg} \cdot \text{s}^2\right)$$

$$\hbar = \frac{c^5}{\omega_U^2 G} = \frac{\left[0.299792458 \times 10^9 \, (\text{m/s})\right]^5}{\left[18.5490492 \times 10^{42} \left(\text{s}^{-1}\right)\right]^2 \times 6.673969698 \times 10^{-11} \left(\text{m}^3/\text{kg} \cdot \text{s}^2\right)} \quad (27)$$

$$= 1.054571800 \times 10^{-34} \left(\text{kg} \cdot \text{m}^2/\text{s}\right)$$

$$c = \sqrt[5]{\omega_U^2 G\hbar}$$

$$= \sqrt[5]{\left[18.5490492 \times 10^{42} \left(\text{s}^{-1}\right)\right]^2 \times 6.673969698 \times 10^{-11} \left(\text{m}^3/\text{kg} \cdot \text{s}^2\right) \times 1.054571800 \times 10^{-34} \left(\text{kg} \cdot \text{m}^2/\text{s}\right)} \quad (28)$$

$$= 0.299792458 \times 10^9 \, (\text{m/s})$$

This reduces the parameters $\lambda_g = \lambda_u$, $T_g = T_u$, $m_g = m_u$ (23) to (25) to the circular wave characteristics of the Unified field of the Universe. Their further regis-

tration in CODATA is also planned.

The constant $v_G = v_U$ has the only dimension—time in seconds (s^{-1}) ore Hz, and the constant $\omega_g = \omega_u$ has the dimension of rad/s. Since the radian is not have unit of metrical quantity, this reduces $\omega_g = \omega_u$ to time in seconds (s^{-1}). All other constants (1) to (7) have dimensions in which the frequencies s^{-1} is included as constituent elements. Therefore, Nastasenko's constants are primary in relation to all other fundamental physical constants, which bring them to a special (primary) level of significance in the material world. Moreover, this is the oscillation frequency of the waves of the Unified gravitational and electromagnetic fields of the Universe: $v_G = v_U$, which increases its significance compared to h and G associated with one of the types of these fields.

It should also be taken into account that among the basic constants (1) to (7) the speed of light is referred of the vacuum [2] [5], since it depends on the medium of its propagation. However, this dependence reduces the level of its fundamental nature in comparison with other constants that do not have the indicated restrictions, which requires the elimination of the indicated drawback. In this case, the speed of light in [3] [20], it was proposed to replace the speed of the waves of the gravitational field of the Universe, which does not depend on the medium of their propagation. However, it is more accurate to refer this speed it to the velocity c_U of the waves of the Unified Field of the Universe (29):

$$
\begin{aligned}
c_U &= \lambda_U v_U = 4.051249\,|\,432\,|\times 10^{-35}\,(\text{m}) \times 7.4 \times 10^{42}\,(\text{s}^{-1}) \\
&= 0.299792458 \times 10^{9}\,(\text{m/s})
\end{aligned}
\tag{29}
$$

Therefore, a transition from the speed of light c in vacuum to a new fundamental constant of speed c_U (29) is necessary, which are numerically equal to each other: $c_U = c$, as constituent elements of the unified field of the Universe [3].

Thus, taking into account that the constants $\hbar$ and ω_u are derivatives of the constants h and v_U through their relationship with the number 2π, it can be strictly argued that in the foundations of the material world are not 6 (**Figure 1**), but 7 fundamental physical constants (**Figure 2**).

This expands scientific knowledge about of initial (zero) level. Replacement of abstract Planck values (**Figure 1**) with real values of the Unified field of the Universe (**Figure 2**) also refines and expands knowledge about the initial (zero) level of the material world. In this case, shown in **Figure 2**, the list of 7 fundamental constants is supplemented by new linear (15) to (17) and circular (23) to (25) values quants of the Unified field of the Universe.

Thus, there are 3 factors to consider:

1) The proven priority of the Nastasenko constants vU and ωu with respect to the Planck constants h and $\hbar$, as well as to other fundamental physical constants;

2) The need to replace the constant of the speed of light c, which depends on the medium of its propagation, with the speed c_U of the waves of the Unified field of the Universe, which does not depend on the medium of their propagation;

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0. Quantum-mechanical level of Nastasenko:

Fundamental physical constants: v_U, (ω_u), c_U, h, $(\hbar)$, G, ε_0, μ_0, b,

Linear wavelength of the Unified Field of the Universe:

$$\lambda_U = \lambda_G = \frac{c_U}{v_U} = 4.051249\,|\,432\,|\times10^{-35}\,(m).$$

Circular wavelength of the Unified Field of the Universe:

$$\lambda_u = \lambda_g = \frac{c_U}{\omega_u} = 1.61621469\times10^{-35}\,(m).$$

Linearoscillation period of the waves of the Unified field of the Universe:

$$T_U = T_G = \frac{1}{v_U} = 0.\,|\,135\,|\times10^{-42}\,(s).$$

Circularoscillation period of the waves of the Unified field of the Universe:

$$T_u = T_g = \frac{1}{\omega_u} = 5.39111191\times10^{-42}\,(s).$$

Linearmass equivalent of the energy of the Unified Field of the Universe:

$$m_U = m_G = \frac{E_U}{c_U{}^2} = \frac{hv_U}{c_U{}^2} = 5.455647896\times10^{-8}\,(kg).$$

Circularmass equivalent of the energy of the Unified Field of the Universe:

$$m_u = m_g = \frac{E_u}{c_U{}^2} = \frac{\hbar\omega_u}{c_U{}^2} = 2.17649040\times10^{-8}\,(kg).$$

Figure 2. Replacing the Planck level of the material world with the level of Nastasenko.

3) Transition from abstract Planck values of length, time and mass to real values of the Unified field of the Universe: wavelength, period of their oscillations and mass, as the energy equivalent of these waves.

Therefore, from the original values of the Planck level (Figure 1) in the new level (Figure 2), only Planck's constants h and $\hbar$ remain, which are secondary with respect to the Nastasenko constants v_U and ω_u. All other parameters are different in it. In this case, there is every reason to consider the initial (zero) level of the material world not as the Planck one, but as the quantum-mechanical level of Nastasenko (Figure 2), instead of the Planck one (Figure 1), previously named by the author of this work.

The discovery of a new level of the material world, which is deeper than the levels of atoms, their nuclei and elementary particles, is a great scientific achievement, which was first made in 2000 in [4] and structured in [3]. Therefore, within the framework of the law on scientific discoveries [13], there is every right to name this level by the name of its discoverer.

4. Conclusions

1) On the basis of strict physical laws and dependencies, the necessity of introducing the initial (zero) level of the material world, which precedes its first level, associated with elementary particles, has been substantiated.

2) On the basis of strict physical laws and dependencies, a new fundamental physical constant was found—the frequency of oscillation of the waves of the Unified field of the Universe $v_G = v_U \to 7.4 \times 10^{42}$ s^{-1} (Nastasenko's constant), which expands scientific knowledge about the initial (zero) level of the material

world and is primary in relation to Planck's constant and to other fundamental physical constants.

3) On the basis of the Nastasenko constant $v_G = v_U$, it is possible to replace the abstract Planck values of length, time and mass with real values of the Unified field of the Universe: its wavelength, period of their oscillations and mass, as the value of the energy equivalent of these waves.

4) Based on the connection of Planck's constants h and $\hbar$, it is possible to replace abstract circular Planck values of length, time and mass with real circular values of the Unified field of the Universe: it's of circular wavelength, of the period their oscillations and mass, as the value of the energy equivalent of these waves.

5) Determination of the wave parameters of the gravitational field and the solution of the problem of unified the gravitational and electromagnetic fields became possible only with the transition to the zero level of the material world, which was first proposed in the works of V. Nastasenko.

6) Taking into account clauses 1 and 4, there is every reason for the initial (zero) level of the material world, which was previously called Planck's, to replace it with the Nastasenko level, with the introduction of new physical constants into it.

7) Given the novelty and rigor of obtaining new values on the basis of reliable physical laws, they have all the signs of scientific discoveries and can be recommended for use in scientific research and in the study of the disciplines of quantum physics in higher educational institutions, as well as adapted in secondary specialized educational institutions and in schools.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

[1] Vasil'yev, V.V., Krotov, A.A. and Bugay, D.V. (Eds.) (2005) Istoriya filosofii [History of Philosophy]. Akademicheskiy Proyekt, Moskow. (In Russian)

[2] Alekseev, D.V., Bonch-Bruevich, A.M., Voronov-Romanov, A.S., *et al.* (1983) Phizicheskij encyclopedicheskij slovar [Physical Encyclopaedic Dictionary]. Prohorov, A.M. (Ed.), Sov. Encyclopedia, Moskow. (In Russian)

[3] Nastasenko V. (2020) New Substantiation of the Initial Level of the Universe. 3*rd International Scientific and Practical Conference Eurasian Scientific Congress*, Barca Academy Publishing, Barcelona, 182-187.
http://sci-conf.com.ua/iii-mezhdunarodnaya-nauchno-prakticheskaya-konferentsiya-eurasian-scientific-congress-22-24-marta-2020-goda-barselona-ispaniya-arhiv/?utm_source=esputnik-promo&utm_medium=email&utm_campaign=materialy_barselona&utm_content=749095643

[4] Nastasenko, V.A. (2000) Etalon massy v elementakh kvantovoy fiziki [The Standard of Mass in the Elements of Quantum Physics]. Mashinostroyeniye i tekhnosfera na rubezhe XXI veka. Sbornik trudov VII Mezhdunarodnoy nauchno-tekhnicheskoy

konferentsii v g. Sevastopole. Donetsk, DonGTU, T1,95-100. (In Russian)
http://konf-sev.donntu.org/arhiv.htm

[5] CODATA (2018) Internationally Recommended Values of the Fundamental Physical Constants.
http://www.codata.org/committees-and-groups/fundamental-physical-constants

[6] Belov, A.F., Voskobounikov, V.G., *et al.* (1989) Politechnicheskij slovar. [Polytechnical Dictionary]. Red. col.: A.Yu. Ishlinskij (gl. red.) i dr, -3-e izd., pererab. i dop. M.: Sov. Encyclopedia, 134, 382, 486, 638-640. (In Russian)
http://www.encyclopedia.ru/cat/books/book/2459/

[7] Silk Dzh (1982) Bol'shoy vzryv: [The Big Bang] Per. s angl. /Pod red. I.D. Novikova. -M.: Mir. 391 p. (In Russian)

[8] Zakony dialektiki [Laws of Dialectics]. (In Russian)
http://ponjatija.ru/node/5641#:~:text=%D0%97%D0%90%D0%9A%D0%9E%D0%9D%D0%AB%20%D0%94%D0%98%D0%90%D0%9B%D0%95%D0%9A%D0%A2%D0%98%D0%9A%D0%98%20%2D%20%D0%B7%D0%B0%D0%BA%D0%BE%D0%BD%D1%8B%2C%20%D0%BE%D0%BF%D1%80%D0%B5%D0%B4%D0%B5%D0%BB%D1%8F%D1%8E%D1%89%D0%B8%D0%B5%2C%D0%B8%20%D0%BE%D0%B1%D1%80%D0%B0%D1%82%D0%BD%D0%BE%2C%20%D0%B7%D0%B0%D0%BA%D0%BE%D0%BD%20%D0%BE%D1%82%D1%80%D0%B8%D1%86%D0%B0%D0%BD%D0%B8%D1%8F%20%D0%BE%D1%82%D1%80%D0%B8%D1%86%D0%B0%D0%BD%D0%B8%D1%8F

[9] Настасенко, В.А. (2011) Новые возможности аналитического уточнения величины гравитационной постоянной. Науковий вісник ХНТУ: науковий журнал. Херсон, ХНТУ, No. 4(43), 93-99. (In Russian)
http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?I21DBN=LINK&P21DBN=UJRN&Z21ID=&S21REF=10&S21CNR=20&S21STN=1&S21FMT=ASP_meta&C21COM=S&2_S21P03=FILA=&2_S21STR=Vkhdtu_2011_4_22

[10] Nastasenko, V.A. (2013) O vozmozhnosti utochneniya znacheniya gravitacionnoyj postoyannoyj raschetnihm putem [On the Possibility of Refinement of the Value of the Gravitational Constant by Calculation]. Megdunarodnaja nauchno-technisheskaja konferencia Vihsokoproizvoditeljnihe vihchisliteljnihe sistemi National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, 2, 266-272. (In Russian)

[11] Nastasenko V.A. (2014) O vozmozhnosty opredelenyya volnovykh parametrov hravytatsyonnoho polya. [On the Possibility of Determining the Wave Parameters of a Gravitational Field.] *Visnyk Khersons'koho natsional'noho tekhnichnoho universytetu—Kherson. KHNTU*, **1**, 71-76. (In Russian)

[12] Nastasenko, V.A. (2018) Discovery of Analytical Method Defined of Wave Parameters Gravitation Field/Valentyn Alekseevitcn Nastasenko. *Journal Laser Opt Photonics*, No. 5, 1.

[13] Civiljniyj kodeks Ukrainu [Civil Code of Ukraine] (2003) Zakonu Ukrainu. Shkola, Kyiv. (In Ukrainian) http://zakon2.rada.gov.ua/laws/show/435-15

[14] Nastasenko V.A. (2014) Novye osnovy dlya strohoho opredelenyya volnovykh parametrov hravytatsyonnoho polya y ob″edynenye hravytatsyonnoho y électromahnytnoho poley. [New Bases for Strict Determination of the Wave Parameters of the Gravitational Field and the Union of Gravitational and Electromagnetic Fields.] Naukovyy visnyk KHDMA: Naukovyy Zhurnal., Kherson, KHDMA, No. 1(10), 213-222. (In Russian)
http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?I21DBN=LINK&P21DBN=UJRN&Z21ID=&S21REF=10&S21CNR=20&S21STN=1&S21FMT=ASP_

meta&C21COM=S&2_S21P03=FILA=&2_S21STR=Nvkhdmi_2014_1_31

[15] Nastasenko, V.A. (2017) Union of Gravitational and Electromagnetic Fields on the Basis of Nontraditional Principles. *Electrical & Computer Engineering*, **6**, 19-30. https://doi.org/10.14810/ecij.2017.6402

[16] Nastasenko, V.A. (2018) Possibility of Refining the Gravitational Constant and Solving the Task of Integrating the Gravitational and Electromagnetic Fields. *Journal of Astrophysics & Aerospace Technology*, **6**, 1. https://doi.org/10.4172/2329-6542.1000155

[17] Nastasenko, V.A. (2019) Unified Field of the Universe and Determining of Its Wave Parameters. *International Conference on Electrical, Communication, Electronics, Instrumentation and Computing (ICECEIC)*, Tamil Nadu, 30-31 January 2019.

[18] Nastasenko, V.A. (2018) Justification the Wave Oscillation Frequency of the Unified Field of the Universe. 4*th International Conference on Astrophysics and Particle Physics*, Chicago, 3-5 December 2018. https://www.omicsonline.org/conference-proceedings/2329-6542-C7-036-003.pdf

[19] Nastasenko, V. (2020) Analysis of the Processes of Gravity in the Framework of Curvature of Space and the Substantiation of the New Model. *Journal of Applied Mathematics and Physics*, **8**, 2732-2743. https://doi.org/10.4236/jamp.2020.812202

[20] Nastasenko, V.A. (2018) New Fundamental Physical Constant of the Universe and its Connection with the Material World Basics. *Global Summit on Physics (GSP* 2018) & *World Congress on Quantum and Nuclear Engineering (WCQNE* 2018), Madrid, 27-28 September 2018, 38.