We can't solve problems by using the same kind of thinking we used when we created them.

Albert Einstein

WORLD – UNIVERSE MODEL

THE SUMMARY

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ABSTRACT

World – Universe Model is based on three primary assumptions:

1) The World is finite and is expanding inside the Universe with speed equal to the gravitoelectrodynamic constant *c*. The Universe serves as an unlimited source of matter that continuously enters into the World from the Front (the moving World – Universe boundary).

2) Medium of the World, consisting of protons, electrons, photons, neutrinos, and dark matter particles, is an active agent in all physical phenomena in the World.

3) Two fundamental parameters in various rational exponents define all macro and micro features of the World: Fine-Structure Constant α, and dimensionless quantity Q. While α is constant, Q increases with time, and is in fact a measure of the size and the age of the World. Dimensionless quantity Q- squared is a measure of the World's matter content.

The World – Universe Model provides a mathematical framework that is based on the preceding assumptions and allows calculating the primary parameters of the World that are in good agreement with the most recent measurements and observations.

1. COSMOLOGY

The World – Universe Model (WUM) is built on two major assumptions: the universality of physical laws and the cosmological principle. The cosmological principle states that on large scale the World is homogeneous and isotropic. The WUM envisions an expansion of the World [1-6].

1.1. THE BEGINNING

About 14.223 billion years ago the World was started by a fluctuation in the Universe, and the Nucleus of the World was born. The radius of the World's Nucleus at the Beginning was equal to

$$a = 2\pi a_0 \qquad 1.1$$

where a_0 is the classical electron radius. The extrapolated energy density of the World at the Beginning was much smaller than the nuclear energy density. Prior to this event, there was nothing but the Universe.

1.2. THE EXPANSION

The World has since been expanding through the Universe with speed equal to the gravitoelectrodynamic constant c for time t (and thus now has the radius of $R = ct$), consuming energy as the Front (the moving World – Universe boundary) advances.

1.3. THE BLACK HOLE

According to the Model, the World is a Black hole whose radius equals to the Hubble radius. Residing inside of a Black hole, we can conduct no observations of the outside Universe, and learn nothing about its characteristics.

The hypothesis *that the universe may not only be a closed structure (as perceived by its inhabitants at the present epoch) but may also be a black hole, confined to a localized region of space which cannot expand without limit* was proposed by Raj Pathria in 1972 [7]. In our Model, the World expands in the Universe without limit, because the Universe is an unlimited source of energy.

1.4. EVENT HORIZON AND FLATNESS

The principal idea of the World – Universe model is that the energy density of the World ρ_W equals to the critical energy density ρ_{cr} necessary for a flat World. The World is a closed structure whose radius equals to the Hubble radius. Hence the Horizon problem does not arise.

1.5. THE CREATION OF MATTER

> *There is no energy in matter other than that received from the environment.*
>
> Nikola Tesla

Creation of particle – antiparticle pairs is occurring near the black hole's event horizon. Antiparticles escape out of the World, and particles continue on into the World. In other words, all antimatter makes up the Front, and equal amount of matter exists in the World, resolving the long-standing "Matter – Antimatter Asymmetry" paradox.

The Front has a temperature invariant surface enthalpy $\sigma_0 = \frac{hc}{a^3}$ (h is Planck constant). Amount of energy added to the World is proportional to the increase of the area of the Front. The total amount of the World energy is thus

$$E_W = 4\pi R^2 \sigma_0 \quad 1.2$$

The energy density of the World ρ_W is inversely proportional to the radius of the World R:

$$\rho_W = \frac{3\sigma_0}{R} \quad 1.3$$

The proposed mechanism of creation of matter at the Front differs from the continuous creation of matter discussed by Paul Dirac in 1974 [8] that he described as follows:

- *One might assume that nucleons are created uniformly throughout space, and thus mainly in intergalactic space. We may call this* ***additive creation****.*
- *One might assume that new matter is created where it already exists, in proportion to the amount existing there. Presumably the new matter consists of the same kind of atoms as those already existing. We may call this* ***multiplicative creation****.*

1.6. The World's Matter Content

> *All attempts to explain the workings of the universe without recognizing the existence of the ether and the indispensable function it plays in the phenomena are futile and destined to oblivion.*
>
> Nikola Tesla

The World consists of the Medium (protons, electrons, photons, neutrinos, and dark matter particles) and Macroobjects (Galaxy clusters, Galaxies, Star clusters, Extrasolar systems, etc.) made of these particles. In frames of the Model, empty space and dark energy don't exist.

Maxwell's equations for electromagnetism and gravitoelectromagnetism describe how electromagnetic and gravitoelectromagnetic fields are generated and altered by each other and by charges and masses and their currents.

Back in 1839 James McCullagh proposed a theory of rotationally elastic medium, i.e. the medium in which every particle resists absolute rotation [9]. This theory produces equations analogous to Maxwell's electromagnetic equations. In our opinion, the Medium of the World is in fact such a rotationally elastic medium.

1.7. Newtonian Parameter of Gravitation

Recall the well-known Friedmann equation for the critical energy density of the World ρ_{cr}:

$$\rho_{cr} = \frac{3H_0^2 c^2}{8\pi G} \quad 1.4$$

where H_0 is the Hubble parameter:

$$H_0 = \frac{1}{t} = \frac{c}{R} \tag{1.5}$$

The principal idea of the Model is that the energy density of the World ρ_W equals to the critical energy density ρ_{cr}:

$$\rho_{cr} = \rho_W = \frac{3\sigma_0}{R} \propto \frac{1}{R} \tag{1.6}$$

We see that the gravitational parameter G is also proportional to $\frac{1}{R}$ and is decreasing in time as $G \propto \frac{1}{t}$. This property of parameter G was originally hypothesized by Paul Dirac in 1937 [10].

The constancy of the universe fundamental constants, including Newtonian constant of gravitation G, is now commonly accepted, although has never been firmly established as a fact. All conclusions on the constancy of G are strongly model-dependent [1, 11, 12]. Consequently, variability of G with time can legitimately be explored. Alternative cosmological models describing the Universe with time varying G are widely discussed in literature (see e.g. [1-3] and references therein).

WUM is based on Maxwell's equations for the gravitoelectromagnetic field which have two measurable parameters: energy density and energy flux density. Newtonian parameter of gravitation G is the phenomenological coefficient in the Newton's law of universal gravitation.

In accordance with WUM the parameter G can be calculated based on the value of the energy density of the Medium of the World $\rho_M = \frac{2}{3}\rho_W$:

$$G = \frac{\rho_M}{16\pi}\left(\frac{c^2}{\sigma_0}\right)^2 \tag{1.7}$$

Then the Newton's law of universal gravitation can be rewritten in the following way:

$$F = G\frac{mM}{r^2} = \frac{\rho_M}{16\pi}\frac{\frac{mc^2 Mc^2}{\sigma_0 \ \sigma_0}}{r^2} \tag{1.8}$$

where we introduced the measurable parameter of the Medium – ρ_M instead of the phenomenological coefficient G; and gravitoelectromagnetic charges $\frac{mc^2}{\sigma_0}$ and $\frac{Mc^2}{\sigma_0}$ instead of macroobjects masses m and M. The gravitoelectromagnetic charges have a dimension of "area", which is equivalent to energy, with the coefficient that equals to the surface enthalpy σ_0.

In our Model:

- The gravitational parameter G can be calculated based on the value of H_0:

$$G = \frac{(ac)^3}{8\pi hc}H_0 \tag{1.9}$$

- The Hubble's parameter H_0 is the impedance of the Medium filled with matter. It follows that measuring the value of Hubble's parameter anywhere in the World and taking its inverse value allows us to calculate the absolute age of the World.

- The gravitomagnetic parameter of the Medium μ_M :

$$\mu_M = \frac{1}{R} \tag{1.10}$$

Taking its inverse value, we can find the absolute radius of the World. We emphasize that the above two parameters (H_0 and μ_M) are principally different physical characteristics of the Medium that are connected through the gravitoelectrodynamic constant c. In the World – Universe Model, time and space are closely connected with the Medium's impedance and gravitomagnetic parameter. It follows that neither time nor space could be discussed in absence of the Medium. Matter, then, is primary to time and space. It follows that the gravitational parameter G can be introduced only for the World filled with matter, as Einstein postulated:

When forced to summarize the theory of relativity in one sentence: time and space and gravitation have no separate existence from matter.

While in our Model the Hubble's parameter H_0 has a clear physical meaning, the gravitational parameter G is the phenomenological coefficient in the Newton's law of universal gravitation and in Einstein's theory of general relativity.

1.8. Time Varying Primary Parameters of the World

In accordance with the WUM, the primary parameters of the World can be expressed as follows:

- Newtonian parameter of gravitation G

$$G = \frac{a^2 c^4}{8\pi h c} \times Q^{-1} \tag{1.11}$$

- Hubble's parameter H_0

$$H_0 = \frac{c}{a} \times Q^{-1} \tag{1.12}$$

- Age of the World A_t

$$A_t = \frac{a}{c} \times Q \tag{1.13}$$

- Size of the World R

$$R = a \times Q \tag{1.14}$$

- Temperature of the microwave background radiation T_{MBR}

$$T_{MBR} = \frac{E_0}{k_B}\left(\frac{15\alpha}{2\pi^3}\frac{m_e}{m_p}\right)^{\frac{1}{4}} \times Q^{-\frac{1}{4}} \tag{1.15}$$

- Temperature of the far-infrared background radiation peak T_{FIRB}

$$T_{FIRB} = \frac{E_0}{k_B}\left(\frac{15}{4\pi^5}\right)^{\frac{1}{4}} \times Q^{-\frac{1}{4}} \tag{1.16}$$

where m_p is the mass of a proton, m_e is the mass of an electron, k_B is Boltzmann constant, α is the fine-structure constant, and the basic energy unit E_0 equals to

$$E_0 = \frac{hc}{a} \tag{1.17}$$

- Critical energy density ρ_{cr}:

$$\rho_{cr} = \frac{3hc}{a^4} \times Q^{-1} \quad 1.18$$

- Total energy of the World E_W at current time t

$$E_W = \frac{4\pi R^2 hc}{a^3} = 4\pi E_0 \times Q^2 = 4\pi E_0 \left(\frac{A_t}{t_0}\right)^2 \quad 1.19$$

where the basic unit of time t_0 equals to

$$t_0 = \frac{a}{c} \quad 1.20$$

The proportionality of total energy in the World to its age squared ($E_W \propto A_t^2$) was also hypothesized by Paul Dirac [10].

Using equation 1.11 we can find the dimensionless time varying fundamental parameter Q based on the value of Newtonian parameter of gravitation G. The value of Q can also be found through measuring of the temperature of the microwave background radiation using equation 1.15. Based on Q, the other time varying parameters can be calculated. More precise measurement of Q yields more precision in measurement of any Q-dependent parameter. We propose to introduce Q as a new fundamental parameter tracked by CODATA, and use its value in calculation of other time-dependent parameters.

1.9. MACROOBJECTS OF THE WORLD

All macroobjects of the World (galaxy clusters, galaxies, star clusters, stars, and planets) have cores made up of different Dark Matter (DM) particles (see Section 2.3). The theory of fermion compact stars made up of DM particles is well developed. Scaling solutions are derived for free and an interacting Fermi gas in [1]. The calculated parameters of fermion compact stars show that

- White Dwarf Shells around the nuclei made of strongly interacting WIMPs or neutralinos compose the cores of stars in extrasolar systems;
- Dissociated DIRACs to Monopoles form cores of star clusters;
- Dissociated ELOPs to Preons constitute cores of galaxies;
- Sterile neutrinos make up cores of galaxy clusters.

The energy consumption rates are greater for galaxies relative to extrasolar systems, and for the World relative to galaxies. It follows that new stars and star clusters can be created inside of a galaxy, and new galaxies and galaxy clusters can arise in the World. Structures form from top (the World) down to extrasolar systems in parallel around different cores made of different DM particles. Formation of galaxies and stars is not a process that concluded ages ago; instead, it is ongoing.

1.10. NUCLEOSYNTHESIS

Nucleosynthesis of all elements occurs inside stars during their evolution (Stellar nucleosynthesis). The theory of this process is well developed, starting with the publication of a celebrated B²FH review paper in 1957 [13]. With respect to WUM, stellar nucleosynthesis theory should be enhanced to account for annihilation of heavy Dark Matter particles (WIMPs and neutralinos). The amount of energy produced due to this process is sufficiently high to produce all elements inside stellar cores.

1.11. COSMOLOGICAL REDSHIFT

The World – Universe model gives the following explanations for supernovae 1a distance measurements and their relation to redshift:

- All macroobjects of the World were fainter in the past. As their cores absorb new energy, the sizes of macroobjects and thus their luminosity are increasing in time $\propto t$. For example, taking the age of the World $\cong 14.2$ Byr and the age of solar system $\cong 4.6$ Byr, it is easy to find that the young Sun's output was only 67.6% of what it is today. Literature commonly refers to the value of 70%. The same holds true for all other macroobjects.
- In accordance with Hubble's law, the distance d to galaxies for $z \ll 1$ is found to be proportional to z:

$$d = \frac{c}{H_0} z = Rz \qquad 1.21$$

The relationship of distance d to the redshift z for large values of z is not presently conclusive, active research is conducted in the area. In the WUM, the distance to galaxies equals to

$$d = \frac{c}{H_0} \frac{z}{1+z} = R \frac{z}{1+z} \qquad 1.22$$

which reduces to 1.20 for $z \ll 1$ and $d = R$ for $z \to \infty$. Thus for $z > 1$, the distance to supernovae is smaller than expected and hence supernovae are brighter. In other words there are *observations that redshifts are larger than expected from a "dusty" Friedmann-Lemaitre universe and the local measured Hubble constant* [Wikipedia, Dark energy]. There is then no reason to introduce dark energy in order to explain the nonlinear relationship of distance to the redshift.

1.12. ULTIMATE FATE

The World is continuously receiving matter from the Universe that envelopes it. Assuming an unlimited Universe, the numbers of cosmological structures on all levels will increase: new galaxy clusters will form; existing clusters will obtain new galaxies; new stars will be born inside existing galaxies; sizes of individual stars will increase, etc. The temperature of the Medium of the World will asymptotically approach absolute zero.

2. ASTROPARTICLE PHYSICS

2.1. BASIC UNIT OF MASS

More than 60 years ago, Y. Nambu proposed an empirical mass spectrum of elementary particles with a mass unit close to one quarter of the mass of a pion (about $\frac{m_0}{2} \cong 35\ MeV/c^2$) [14]. He noticed that meson masses are even multiplies of a mass unit $\frac{m_0}{2}$, baryon (and also unstable lepton) masses are odd multiplies, and mass differences among similar particles are quantized by $m_0 \cong 70\ MeV/c^2$. During the last 40 years M. Mac Gregor studied this property extensively [15].

In the WUM we introduced the basic unit of mass m_0 that equals to

$$m_0 = \frac{\mathrm{h}}{\mathrm{ac}} = 70.025267\ MeV/c^2 \qquad 2.1$$

2.2. PROTON-ELECTRON LOW DENSITY PLASMA

In our Model, the World consists of stable elementary particles with lifetimes longer than the age of the World. Protons with mass m_p and electrons with mass $m_e = \alpha m_0$ have identical concentrations in the World:

$$n_p = n_e = \frac{2\pi^2}{a^3}\frac{m_e}{m_p} \times Q^{-1} = 0.25480\ m^{-3} \qquad 2.2$$

which is in good agreement with their estimated concentration in the intergalactic medium $n_p \cong 0.25\ m^{-3}$ [Wikipedia, Outer space].

Low density plasma consisting of protons and electrons has plasma frequency ν_{pl}:

$$\nu_{pl} = \frac{c}{a}\left(\frac{m_e}{m_p}\right)^{\frac{1}{2}} \times Q^{-\frac{1}{2}} = 4.5322\ Hz \qquad 2.3$$

Photons with energy smaller than $E_{ph} = h\nu_{pl}$ cannot propagate in plasma, thus $h\nu_{pl}$ is the smallest amount of energy a photon may possess. This amount of energy can be viewed as a particle which we'll name an axion (see Section 2.5).

2.3. DARK MATTER PARTICLES

> *The mystery about α is actually a double mystery. The first mystery - the origin of its numerical value ≈ 1/137 has been recognized and discussed for decades. The second mystery – the range of its domain – is generally unrecognized.*
>
> Malcolm H. Mac Gregor

There are three prominent hypotheses on nonbaryonic DM, namely Hot Dark Matter (HDM), Warm Dark Matter (WDM), and Cold Dark Matter (CDM) [Wikipedia, Dark Matter]. In our Model, DM particle masses are proportional to m_0 multiplied by different exponents of α. Consequently, we can predict the masses of various types of DM particles:

CDM particles (fermions Neutralinos and WIMPs):

$$m_N = \alpha^{-2} m_0 = 1.3149950\ \ TeV/c^2 \quad (2.4)$$

$$m_{WIMP} = \alpha^{-1} m_0 = 9.5959823\ \ GeV/c^2 \quad (2.5)$$

DIRACs (bosons):

$$m_{DIRAC} = 2\alpha^0 \frac{m_0}{2} = 70.025267\ \ MeV/c^2 \quad (2.6)$$

ELOPs (bosons):

$$m_{ELOP} = 2\alpha^1 \frac{m_0}{3} = 340.66606\ \ keV/c^2 \quad (2.7)$$

WDM particles (sterile neutrinos have both Dirac and Majorana terms [6]):

$$m_{\nu_s} = \alpha^2 m_0 = 3.7289402\ \ keV/c^2 \quad (2.8)$$

These values fall into the ranges estimated in literature (see [1] and references therein).

Our Model holds that the energy densities of all types of DM particles are proportional to the proton energy density in the World's Medium:

$$\rho_p = \frac{2\pi^2\alpha}{3}\rho_{cr} = 0.0480146654\rho_{cr} \quad (2.9)$$

In all, there are 5 different types of DM particles. Then the total energy density of DM is

$$\rho_{DM} = 5\rho_p = 0.24007327\rho_{cr} \quad (2.10)$$

which is close to the DM energy density discussed in literature: $\rho_{DM} \cong 0.23\,\rho_{cr}$ [Wikipedia, DM].

Note that one of outstanding puzzles in particle physics and cosmology relates to so-called cosmic coincidence: the ratio of dark matter density in the World to baryonic matter density in the Medium of the World $\cong 5$ [16, 17].

The signatures of DM particles annihilation with predicted masses of 1.3 TeV, 9.6 GeV, 70 MeV, 340 keV, and 3.7 keV are found in spectra of the diffuse gamma-ray background and the emission of various macroobjects in the World [5].

The main suggestion for experimentalists dealing with observations of Dark Matter is to concentrate their efforts on particles possessing masses shown above.

2.4. Mass Varying Neutrinos

It is now established that there are three different types of neutrinos: electronic ν_e, muonic ν_μ, and tauonic ν_τ, and their antiparticles. Pontecorvo and Smorodinskii discussed the possibility of energy density of neutrinos exceeding that of baryonic matter [18]. Neutrino oscillations imply that neutrinos have non-zero masses.

In the WUM, neutrino masses are related to and proportional to m_0 multiplied by fundamental parameter $Q^{-\frac{1}{4}}$ and different coefficients. Consequently, masses of neutrinos can be predicted:

$$m_{\nu_e} = \frac{1}{24} m_0 \times Q^{-\frac{1}{4}} = 3.1250 \times 10^{-4}\ eV/c^2 \qquad 2.11$$

$$m_{\nu_\mu} = m_0 \times Q^{-\frac{1}{4}} = 7.4999 \times 10^{-3}\ eV/c^2 \qquad 2.12$$

$$m_{\nu_\tau} = 6m_0 \times Q^{-\frac{1}{4}} = 4.5000 \times 10^{-2}\ eV/c^2 \qquad 2.13$$

The squared values of the muonic and tauonic masses fall into the ranges of mass splitting Δm^2_{sol} and Δm^2_{atm} for solar and atmospheric neutrinos respectively estimated in literature [1].

The sum of the calculated neutrino masses

$$\Sigma m_\nu \cong 0.053\ eV/c^2 \qquad 2.14$$

is in a good agreement with the value of $0.06\ eV/c^2$ discussed in literature [19].

One of the principal ideas of the World – Universe Model holds that energy densities of Medium particles are proportional to proton energy density in the World's Medium (2.9). Therefore the total neutrinos relative energy density $\Omega_{\nu tot}$ (in the Medium and in macroobjects) in terms of the critical energy density ρ_{cr} (1.16) equals to:

$$\Omega_{\nu tot} = \frac{45}{\pi}\Omega_p = 30\pi\alpha = 0.68775927 \qquad 2.15$$

The total neutrinos energy density is almost 10 times greater than baryonic energy density, and about 3 times greater than Dark Matter energy density.

2.5. Mass Varying Photons, Speed of Light

In our Model, the total mass of a moving particle consists of two components: "rest mass" and "coat mass". A particle's coat is the response of the Medium to the particle's movement. A photon is then a constituent axion, whose frequency-independent effective "rest mass" m_a equals to:

$$m_a = m_0 \left(\frac{m_e}{m_p}\right)^{\frac{1}{2}} \times Q^{-\frac{1}{2}} = 3.6680 \times 10^{-20} m_e = 1.8743 \times 10^{-14}\ eV/c^2 \qquad 2.16$$

In most cases practically all of the photon's energy is concentrated in the axion's coat that is the part of the Medium surrounding the axion. The notion of "wavelength" is thus a macroscopic notion characterizing an ensemble of photons. Axions are fully characterized by their four-momentum. Their "rest mass" is decreasing with time: $m_a \propto t^{-\frac{1}{2}}$ (see 2.16).

The calculated mass of an axion is in agreement with $m_a \sim 10^{-15} eV/c^2$ discussed by C. Csaki *et al.* [20] and with experimental checks of Coulomb's law on photon mass m_{ph}. *A null result of such an experiment has set a limit of* $m_{ph} \lesssim 10^{-14}\ eV/c^2$. *If the photon mass is generated via the Higgs*

mechanism then the upper limit of $m_{ph} \lesssim 10^{-14}\, eV/c^2$ *from the test of Coulomb's law is valid* [Wikipedia, Photon].

The higher the photon's energy, the closer its speed approaches the so-called "speed of light" *c.* But the fact that axions possess non-zero rest masses means that photons can never reach that speed.

2.6. GRAND UNIFIED THEORY

At the very Beginning (Q=1) all extrapolated fundamental interactions of the World – strong, electromagnetic, weak, Super Weak and Extremely Weak (proposed in the WUM), and gravitational – had the same cross-section of $\pi^2 a_0^2$, and were characterized by the Unified coupling constant:

$$\alpha_U = \alpha_S = \alpha_{EM} = \alpha_W = \alpha_{SW} = \alpha_{EW} = \alpha_G = 1 \qquad 2.17$$

At that time, the extrapolated energy density of the World ρ_{cr0} was

$$\rho_{cr0} = 3\frac{hc}{a^4} = 6.0638901 \times 10^{30}\ \frac{J}{m^3} \qquad 2.18$$

which is four orders of magnitude smaller than the nuclear energy density ρ_{nuc} :

$$\rho_{nuc} = (\frac{m_p}{m_0})^4 \frac{hc}{a^4} = 6.5151805 \times 10^{34}\ \frac{J}{m^3} \qquad 2.19$$

The average energy density of the World has since been decreasing and its present value is given by

$$\rho_{cr} = \rho_{cr0} \times Q^{-1} = 7.9775 \times 10^{-10}\ \frac{J}{m^3} \qquad 2.20$$

The gravitational coupling parameter α_G is similarly decreasing:

$$\alpha_G = Q^{-1} \propto t^{-1} \qquad 2.21$$

The weak coupling parameter is decreasing as follows:

$$\alpha_W = Q^{-\frac{1}{4}} \propto t^{-\frac{1}{4}} \qquad 2.22$$

The strong and electromagnetic coupling parameters remain constant in time:

$$\alpha_S = \alpha_{EM} = 1 \qquad 2.23$$

The difference in the strong and the electromagnetic interactions is not in the coupling parameters but in the strength of these interactions depending on the particles involved: electrons with charge e and monopoles with charge $\mu = \frac{e}{2\alpha}$ in electromagnetic and strong interactions respectively.

The super weak coupling parameter α_{SW} and the extremely weak coupling parameter α_{EW} proposed in our Model are decreasing as follows:

$$\alpha_{SW} = Q^{-\frac{1}{2}} \propto t^{-\frac{1}{2}} \qquad 2.24$$

$$\alpha_{EW} = Q^{-\frac{3}{4}} \propto t^{-\frac{3}{4}} \qquad 2.25$$

Super-weak and Extremely-weak interactions provide an important clue to physics beyond the standard model. A new class of super-weakly interacting particles should be searched for in cosmic rays.

2.7. Basis of the World – Universe Model

The World – Universe Model provides a mathematical framework based on a few basic assumptions, allows for precise calculation of values that were only measured experimentally earlier, and makes verifiable predictions [1]. To the best of our knowledge, there is no other Model that would allow one to calculate these values:

$R = 1.3456 \times 10^{26}\ m$ Size

$A_t = 4.4885 \times 10^{17}\ s = 14.223$ billion years Age

$H_0 = 2.2279 \times 10^{-18}\ s^{-1} = 68.746\ \frac{km/s}{Mpc}$ Hubble's parameter

$\rho_{cr} = 7.9788 \times 10^{-10}\ \frac{J}{m^3}$ Critical energy density

$T_{MBR} = 2.7252\ K$ Microwave Background Radiation Temperature

$T_{FIRB} = 28.955\ K$ Temperature of Far-Infrared Background Radiation Peak

While the Model needs significant further elaboration, it can already serve as a basis for a new understanding of the World.

Acknowledgments. I am grateful to Felix Lev, my life-long friend, for our frequent discussions of history and philosophy of Physics. Special thanks to my son Ilya Netchitailo who questioned every aspect of the manuscript and helped shape it to its present form.

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