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Universe (Part 3). Relations between Charge, Time, Matter, Volume, Distance, and Energy.

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Summary

In Universe (Part 1)[1] author has developed a theory which allows derivation of the unknown relations between the main parameters (energy, time, volume, matter) in the Universe. In given part 3 he added charge as main parameter in this theory. He finds also the quantum (minimal values) of energy, time, volume and matter and he applied these quantum for estimations of quantum volatility and the estimation of some values of our Universe and received both well-known and new unknown relations.

Author offers possibly valid relations between charge, time, matter, volume, distance, and energy. The net picture derived is that in the Universe exists ONLY one substance – ENERGY. Charge, time, matter, volume, fields are evidence of this energy and they can be transformed one to other. Author gives the equations which allow to calculate these transformation like the famous formula $E = mc^2$. Some assumptions about the structure of the Universe follow from these relations.

Most offered equations give results close to approximately known data of Universe, the others allow checking up by experiment.

***Key words**:* Universe, time, matter, volume, distance, energy; limits of specific density of energy, matter, pressure, temperature, intensity of fields; collapse of space and time into point.

Introduction

In the theoretical physic the next fundamental constants presented in Table 1 are important .

Table 1: Fundamental physical constants

Constant	Symbol	Dimension	Value in SI units with uncertainties
Speed of light in vacuum	c	$L\,T^{-1}$	2.99792458×10^{8} m s^{-1}
Gravitational constant	G	$L^3\,M^{-1}\,T^{-2}$	$6.67384(80)\times10^{-11}$ m^3 kg^{-1} s^{-2}
Reduced Planck constant	$\hbar = h/2\pi$ where h is Planck constant h = 6.625 068 76(52)×10^{-34}	$L^2\,M\,T^{-1}$	1.054571726(47)×10^{-34} J s
Coulomb constant	$(4\pi\varepsilon_0)^{-1}$ where ε_0 is the permittivity of free space ε_0 = 8.854 187 817…×10^{-12}	$L^3\,M\,T^{-2}$ Q^{-2}	8.9875517873681764×10^9 kg m^3 s^{-2} C^{-2} *(exact by definitions of ampere and meter)*
Boltzmann constant	k_B	$L^2\,M\,T^{-2}$ Θ^{-1}	1.3806488(13)×10^{-23} J/K

Where are: L = length, M = mass, T = time, Q = electric charge, Θ = temperature.

If we take these constants as base units, we get the Planks units:

Table 2: Base Planck units

Name	Dimension	Expression	Value (SI units)

Planck length	Length (L)	$l_\mathrm{P} = \sqrt{\frac{\hbar G}{c^3}}$	1.616 199(97) × 10^{-35} m
Planck mass	Mass (M)	$m_\mathrm{P} = \sqrt{\frac{\hbar c}{G}}$	2.176 51(13) × 10^{-8} kg
Planck time	Time (T)	$t_\mathrm{P} = \frac{l_\mathrm{P}}{c} = \frac{\hbar}{m_\mathrm{P} c^2} = \sqrt{\frac{\hbar G}{c^5}}$	5.391 06(32) × 10^{-44} s
Planck Charge	Electric charge (Q)	$q_\mathrm{P} = \sqrt{4\pi\varepsilon_0 \hbar c}$	1.875 545 956(41) × 10^{-18} C
Planck temperature	Temperature (Θ)	$T_\mathrm{P} = \frac{m_\mathrm{P} c^2}{k_\mathrm{B}} = \sqrt{\frac{\hbar c^5}{G k_\mathrm{B}^2}}$	1.416 833(85) × 10^{32} K

From data Table 2 we can receive the derived Planck units (Table 3).

Table 3: Derived Planck units

Name	Dimension	Expression	Approximate SI equivalent
Planck area	Area (L^2)	$l_\mathrm{P}^2 = \frac{\hbar G}{c^3}$	2.61223 × 10^{-70} m^2
Planck volume	Volume (L^3)	$l_\mathrm{P}^3 = \left(\frac{\hbar G}{c^3}\right)^{\frac{3}{2}} = \sqrt{\frac{(\hbar G)^3}{c^9}}$	4.22419 × 10^{-105} m^3
Planck momentum	Momentum (LMT^{-1})	$m_\mathrm{P} c = \frac{\hbar}{l_\mathrm{P}} = \sqrt{\frac{\hbar c^3}{G}}$	6.52485 kg m/s
Planck energy	Energy (L^2MT^{-2})	$E_\mathrm{P} = m_\mathrm{P} c^2 = \frac{\hbar}{t_\mathrm{P}} = \sqrt{\frac{\hbar c^5}{G}}$	1.9561 × 10^9 J
Plank force	Force (LMT^{-2})	$F_\mathrm{P} = \frac{E_\mathrm{P}}{l_\mathrm{P}} = \frac{\hbar}{l_\mathrm{P} t_\mathrm{P}} = \frac{c^4}{G}$	1.21027 × 10^{44} N
Planck power	Power (L^2MT^{-3})	$P_\mathrm{P} = \frac{E_\mathrm{P}}{t_\mathrm{P}} = \frac{\hbar}{t_\mathrm{P}^2} = \frac{c^5}{G}$	3.62831 × 10^{52} W
Planck density	Density ($L^{-3}M$)	$\rho_\mathrm{P} = \frac{m_\mathrm{P}}{l_\mathrm{P}^3} = \frac{\hbar t_\mathrm{P}}{l_\mathrm{P}^5} = \frac{c^5}{\hbar G^2}$	5.15500 × 10^{96} kg/m^3
Planck energy density	Energy density ($L^{-1}MT^{-2}$)	$\rho_\mathrm{P}^E = \frac{E_\mathrm{P}}{l_\mathrm{P}^3} = \frac{c^7}{\hbar G^2}$	4.63298 × 10^{113} J/m^3
Planck intensity	Intensity (MT^{-3})	$I_\mathrm{P} = \rho_\mathrm{P}^E c = \frac{P_\mathrm{P}}{l_\mathrm{P}^2} = \frac{c^8}{\hbar G^2}$	1.38893 × 10^{122} W/m^2
Planck angular frequency	Frequency (T^{-1})	$\omega_\mathrm{P} = \frac{1}{t_\mathrm{P}} = \sqrt{\frac{c^5}{\hbar G}}$	1.85487 × 10^{43} s^{-1}
Planck pressure	Pressure ($L^{-1}MT^{-2}$)	$p_\mathrm{P} = \frac{F_\mathrm{P}}{l_\mathrm{P}^2} = \frac{\hbar}{l_\mathrm{P}^3 t_\mathrm{P}} = \frac{c^7}{\hbar G^2}$	4.63309 × 10^{113} Pa

Planck currency	Electrictric currency (QT^{-1})	$I_\mathrm{P} = \frac{q_\mathrm{P}}{t_\mathrm{P}} = \sqrt{\frac{4\pi\epsilon_0 c^6}{G}}$	3.4789×10^{25} A
Planck voltage	Voltage ($L^2MT^{-2}Q^{-1}$)	$V_\mathrm{P} = \frac{E_\mathrm{P}}{q_\mathrm{P}} = \frac{\hbar}{t_\mathrm{P} q_\mathrm{P}} = \sqrt{\frac{c^4}{4\pi\epsilon_0 G}}$	1.04295×10^{27} V
Planck impedance	Resistance ($L^2MT^{-1}Q^{-2}$)	$Z_\mathrm{P} = \frac{V_\mathrm{P}}{I_\mathrm{P}} = \frac{\hbar}{q_\mathrm{P}^2} = \frac{1}{4\pi\epsilon_0 c} = \frac{Z_0}{4\pi}$	29.9792458 Ω

Universal units do not depend from Earth units. That is suitable for the Universe communication. They also give the more simple physical equations.

Theory. Relation between charge, time, matter, volume, distance and energy.

The author presents an original theory which allows derivation of unknown relations between main parameters in a given field of nature. He applies his hypotheses to theory of Universe. The next well-known constants used in his equations are below:

$$c = 2.997925\cdot 10^{8}\ m/s, \quad e = 1.60219\cdot 10^{-19}\ C, \quad G = 6.6743\cdot 10^{-11}\ m^3/kg\cdot s^2, \qquad (1)$$

$$\varepsilon_0 = \frac{1}{36\pi\cdot 10^{9}} = 8.8542\cdot 10^{-12}\ \frac{F}{m}, \quad k = \frac{1}{4\pi\varepsilon_0} = 8.987551787\cdot 10^{9}\ \frac{kg\cdot m^3}{s^2},$$

$$\mu_0 = 4\pi\cdot 10^{-7} = 1.257\cdot 10^{-6}\ \frac{H}{m}, \quad h = 6.6261\cdot 10^{-34}\ \frac{kg\cdot m^2}{s^3}, \quad \hbar = h/2\pi,$$

$$\sigma = 5.67032\cdot 10^{-8}\ W/m^2K, \quad \pi = 3.141592654, \quad k_B = 1{,}3896503(24)\cdot 10^{-23}\ J\cdot K^{-1}$$

where c is speed of light in vacuum, m/s; e is electronic charge, C; G is a Newton gravitation constant, Nm^2/kg^2; ε_o is electric constant, F/m; μ_o is magnetic constant, H/m; h is Planck constant, J·s; σ is Stefan – Boltzmann constant, W/m^2K ; k_B is Boltzman constant, J/K.

In our equations below the constant G is constant of gravitation theory, c is constant of relativistic theory, and h is constant of quantum theory. Productions $Ghc^5 \approx 1.071$ and $kc^4 \approx 1.088\times 10^{52}G$ produce the new constants:

$$Ghc^5 \approx 1, \quad kc^4 \approx 10^{52}G, \qquad (2)$$

which we will use in our equation.

The author postulated the following relations:

1. Relations between time , matter , volume , distance, specific density of matter and energy :

$$T = \frac{G}{c^5}E, \quad T = \frac{G}{c^3}M, \quad T = c^{-1}v^{1/3}, \quad T = \frac{R}{c}, \quad T = \left(\frac{kG}{c^2}\right)^{1/2}Q, \quad T = G^{-1/2}\rho^{-1/2}, \qquad (3)$$

$$or \quad T = 2.756144\cdot 10^{-53}E, \quad T = 2.47709939\cdot 10^{-36}M, \quad T = 2.583467\cdot 10^{-9}Q,$$

$$T = 3.33564\cdot 10^{-9}R, \quad T = 2.2448563\cdot 10^{-24}\rho^{-2},$$

where T is time in sec; E is energy in J; M is mass, kg; v is volume in m^3; R is distance, m; ρ is specific density of matter in given volume, kg/m^3, Q is charge, C. (Only the first 6 digits are right in all our formulas).

The dimensional theory is employed; that way these relations are obtained to within a constant factor. That factor may be derived from experiment. This factor has been neglected in cosmology and high energy physics. But these equations (2)-(6) cannot be derived ONLY from dimensional theory because dimensional theory does not contain the physical constants.

Equations (3) may be written in form

$$E=\frac{c^5}{G}T,\quad M=\frac{c^3}{G}T,\quad v=c^3T^3,\quad R=cT,\quad Q=\left(\frac{c^2}{kG}\right)^{1/2}T,\quad \rho=1/(GT^2), \tag{4}$$

$$or\quad E=3.62825745\cdot10^{52}T,\quad M=4.454628\cdot10^{35}T,\quad \rho=1.5\cdot10^{10}/T^2.$$

From these equations follow some interesting propositions. Time is energy, Time depends upon mass, volume, length, electric charges and density of matter. If time simultaneously produced the positive and negative charges, the total charge is zero. Time can create the energy, mass, distance, volume change and the density of matter in the Universe or the energy produce time, matter, distance, volume and charge (positive and negative simultaneously)(see (9)-(10)).

If we will use the relation (2) (quantum constant) the relation between time and the energy, mass, distance, volume and change, may be written in form

$$T\approx hG^2E,\quad T\approx hG^2c^2M,\quad T^3\approx hGc^2v,\quad T\approx hGc^4R,\ T\approx\left(\frac{khG^2}{c}\right)^{1/2}Q, \tag{5}$$

2. Relations between volumes, energy, matter, time, and distance

$$v=\frac{G^3}{c^{12}}E^3\quad v_n=\frac{G^n}{c^{4n}}E^n,\quad v=c^3T^3,\quad v=\frac{G^3}{c^6}M^3,\quad v=\frac{4\pi}{3}R^3, \tag{6}$$

$$or\quad v=5.64115466\times10^{-133}E^3,\quad v=2.694401\times10^{25}T^3,\quad v=4.095365\times10^{-82}M^3,$$

where v is volume of 3-demantional space, m^3; v_n is n-dimensional space, m^n.

3. Relations between matter, time, volume, distance, energy, charge and temperature are

$$M=\frac{c^3}{G}T,\quad M=\frac{c^2}{G}v^{1/3},\quad M=\frac{c^2}{G}R,\quad M=\frac{1}{c^2}E,\quad M=\left(\frac{k}{G}\right)^{1/2}Q,\quad M=\left(\frac{k_B}{G}\right)t, \tag{7}$$

$$M=4.0369797\times10^{35}T,\quad M=1.34659\times10^{27}v^{1/3},\quad M=1.34659\times10^{27}R,$$

$$M=1.40895\times10^{20}Q,\quad M=2.068058\times10^{-13}t.$$

where t is temperature, K; k_B is Boltzmann constant, J/K.

If we will use the relation (2) (quantum constant) the relation between mass, time and the energy, distance, volume and change, may be written in form

$$M\approx\frac{1}{hG^2c^2}T,\quad M\approx\frac{1}{hG^2c^3}R,\quad M\approx hGc^3E, \tag{8}$$

$$M\approx\sqrt{hc^5}Q,\quad M=k_BhGc^3t,$$

4. We can receive from equations (3) - (8) the expressions for the energy from time, volume, distance, mass and charge

$$E=\frac{c^5}{G}T,\quad E=\frac{c^4}{G}v^{1/3},\quad E_n=\frac{c^{4n}}{G^n}v_n^{1/n},\quad E=\frac{c^4}{G}R, \tag{9}$$

$$E=k_Bt,\quad E=\left(\frac{kc^4}{G}\right)^{1/2}Q,\quad E=c^2M,$$

$$E=3.62825745\cdot10^{52}T,\quad E=1.2102562\cdot10^{44}v^{1/3},$$

$$E=1.2102562\cdot10^{44}R,\ E=8.98755\cdot10^{16}M,\quad E=1.0429\cdot10^{26}Q.$$

Here t is temperature, K.

Last equation in (9) is the well known relation between energy and matter. This relationship follows from (2) – (8) as a special case. This indirectly confirms the correctness of the equations (2) – (9) as a special case.

If we will use the relation (2) (quantum constant) the relation between energy, mass, distance, volume, change and temperature may be written in form

$$E \approx \frac{1}{hG^2}T, \quad E \approx \frac{1}{hG^2c}v^{1/3}, \quad E \approx \frac{1}{hG^2c}R\ , \quad E = Mc^2, \quad E \approx \left(\frac{k}{hG^2c}\right)^{1/2}Q, \tag{10}$$

Here *v* (Latin) is volume, m^3.

5. The relations between the density of matter, energy, charge and time (frequency) are following:

$$\rho_M = \frac{1}{G}\frac{1}{T^2}, \quad \rho_M = \frac{1}{G}\nu^2, \quad \rho_E = \frac{h}{c^3}\frac{1}{T^2}, \quad \rho_E = \frac{h}{c^3}\nu^2, \quad \rho_Q = \left(\frac{h}{kc^5}\right)^{1/2}T^2, \quad \rho_Q = \left(\frac{h}{kc^5}\right)^{1/2}\frac{1}{\nu^2}, \tag{11}$$

Where ρ_M , ρ_E, ρ_Q are density of matter, energy and charge respectively, kg/m^3, J/m^3, C/m^3; *v* (Greg) is frequency, 1/s.

If we will use the relation (2) (quantum constant) the relation between the density of the matter, energy, and change, may be written in form:

$$\rho_M \approx \frac{1}{hc^5}\frac{1}{T^2}, \quad \rho_M \approx \frac{1}{hc^5}\nu^2, \quad \rho_E \approx Gh^2c^2\frac{1}{T^2}, \tag{12}$$
$$\rho_E \approx Gh^2c^2\nu^2, \quad \rho_Q \approx \left(\frac{Gh^2}{k}\right)^{1/2}T^2, \quad \rho_Q \approx \left(\frac{Gh^2}{k}\right)^{1/2}\frac{1}{\nu^2},$$

6. The relations between the field intensity of electric, magnetic and gravitation field a mnd time (frequency) are following:

$$E_e = \left(\frac{kh}{c^3}\right)^{1/2}T^2 = \left(\frac{kh}{c^3}\right)^{1/2}\frac{1}{\nu^2}, \quad H = \frac{\varepsilon_0}{c}E_e = \frac{c}{\mu_0}E_e, \quad H_G = (\varepsilon_0 G)^{1/2}E_e = \left(\frac{c^2G}{\mu_0}\right)^{1/2}E_e, \tag{13}$$

Where *Ee, H, H_G* are intensity of electric, magnetic and gravitation fields respectively; ε_0, μ_0 are electric and magnetic constants (see (1)).

Application to current Universe

Let us estimate the real size and parameters (mass, radius, time, density, etc.) of the Universe. We can make it if we accurately know at least one of its parameters.

Thus the most reliable parameter is the lifetime of the Universe after the Big Bang. Estimates of the observed mass and radius are growing all the time. Estimation of the time specified is about 14 billion years now (13.75±0.17 billion years).

$$M = \frac{c^3}{G}T\ , \quad E = \frac{c^5}{G}T\ , \quad R = cT, \quad v = \frac{4}{3}\pi R^3\ , \quad \rho = \frac{1}{GT^2}\ ,$$
$$or \quad M = 4.0369787\cdot 10^{35}T, \quad E = 3.62825745\cdot 10^{52}T\ ,$$
$$R \approx 3\cdot 10^8 T\ , \quad \rho = 1.5\cdot 10^{10}/T^2. \tag{14}$$

Substitute in (14) the age of Universe after Big Bang (*T*=14 billions years = $4.4\cdot 10^{17}$ sec) we receive:

$$M = 1.78\cdot 10^{53}\ kg > 1.4\cdot 10^{53} kg, \quad E = 1.6\cdot 10^{70}\ J,$$
$$R = 1.32\cdot 10^{26}\ m < 4.4\cdot 10^{26}\ m\ , \quad v = 10^{79}\ m^3, \quad \rho = 7.75\cdot 10^{-26}\ kg/m^3 > 10^{-26}\ kg/m^3. \tag{15}$$

In right side of the inequality (15) is given the estimations of universal parameters made by other researchers. They are very different. The author took average or approximate values.

As you see the values received by offered equations and other methods have similar magnitudes. The mass of the Universe is little more because we do not see the whole Universe (only the closer bodies). The estimation of radius is more than light can travel in the time since the origin of the Universe. It is possible the Universe in initial time had other physical laws than now or the expansion of space may account for this. The difference of space density is result of the old methods that do not include invisible matter, dark matter and dark energy.

The main fields are acceleration, gravity, electric, magnetic and photon/radiation. Density of energy in given point of these fields compute by equations:

$$w_a = \frac{1}{G}\frac{a^2}{2}, \quad w_g = \frac{1}{G}\frac{g^2}{2}, \quad w_e = \varepsilon_0 \frac{E^2}{2}, \quad w_m = \mu_0 \frac{H^2}{2}, \quad w_r = \frac{\sigma}{c} t^4, \quad w_E = \frac{c^2}{GT^2}, \tag{16}$$

where w_a is density of acceleration energy, J/m^3; w_g is density of gravitation energy, J/m^3; w_e is density of electric energy, J/m^3; w_m is density of magnetic energy, J/m^3; w_r is density of radiation energy, J/m^3; w_E is time energy density, J/m^3.a is acceleration, m/s^2; g is gravitation, m/s^2; σ is Stefan – Boltzmann constant, W/m^{2}K ; E is electric intensity, V/m or N/C; H is magnetic intensity, T or Vs/m^2 or Wb/m^2; w_r is density of radiation energy, J/m^3; t is temperature , K; T is time, sec. The last two formulas show the energy density depends from temperature and time.

Full energy, W, we find by integration of density to a full volume.

$$W = \int_v w dv \tag{17}$$

These computations in analytical form we can take as relating to simple geometric figures as, for example, the spherical forms of fields.

Note: In many cases the light speed "c" in the equations (2)-(13) may be changed in conventional speed V. That means we can verify the formulas (2)-(13) and find the correct constant factor.

Quanta of energy, charge, time, matter, volume, and distance.

It is known the energy of photon is

$$E_q = h\nu,$$

where v is frequency, 1/s (v = 1, 2, 3, …). The minimal quantum of photon energy is when v = 1,

$$E_q = h. \tag{18}$$

Let us substitute (18) into (3)-(12), we receive the quanta of time, mass, length, volume (size) and charge:

$$T_q = \frac{G}{c^5}E_q = \frac{Gh}{c^5} = 1.82625\cdot 10^{-86}\ s, \quad M_q = \frac{E_q}{c^2} = \frac{h}{c^2} = 7.37254\cdot 10^{-51}\ kg,$$

$$R_q = \frac{G}{c^4}E_q = \frac{Gh}{c^4} = 5.47495\cdot 10^{-78}\ m, \quad v_q = R_q^3 = \frac{G^3h^3}{c^{12}} = 1.64112\cdot 10^{-232}\ m^3,$$

$$Q_q = \left(\frac{hG^2c}{k}\right)^{1/2} E_q = \left(\frac{h^3G^2c}{k}\right)^{1/2} = 2.079086\cdot 10^{-61}\ C, \tag{19}$$

$$V_q = \frac{E_q}{Q_p} = \left(\frac{2\pi k}{c}\right)^{1/2} = 3.532876\cdot 10^{-16}\ V, \quad I_q = \frac{Q_q}{T_p} = \left(\frac{2\pi h^2c^6}{k}\right)^{1/2} = 3.85654\cdot 10^{-18}\ A.$$

where v_q is quantum of volume, m^3; V_q is quantum of voltage, V; I_q is quantum of the electric currency, A, Q_p, T_p are Planck units of charge and time respectively (see Table 2).

Heisenberg uncertainty principle

Heisenberg uncertainty principle are

$$\Delta I \cdot \Delta R \geq \hbar/2, \quad \Delta E \cdot \Delta T \geq \hbar/2, \quad \hbar = h/2\pi, \tag{20}$$

where ΔI, ΔR, ΔE, ΔT are uncertainty of momentum, length, energy and time respectively.

Substitute into (20) the quanta (19) we receive the following the uncertainties the main quanta (19)

$$\begin{aligned}
&\Delta E = \frac{h}{4\pi T_q} = \frac{c^5}{4\pi G} = 2.887272\cdot 10^{51}\ \ J \quad for \quad T_q,\\
&\Delta R = \frac{G}{c^4}\Delta E = \frac{c}{4\pi} = 2.38567258\cdot 10^{7}\ \ m \quad for \quad \Delta E \quad (T_q),\\
&\Delta M = \frac{\Delta E}{c^2} = \frac{c^3}{4\pi G} = 3.212523\cdot 10^{34}\ \ kg \quad for \quad \Delta E \quad (T_q),\\
&\Delta Q = \left(\frac{G}{kc^4}\right)^{1/2}\Delta E = 8.6971819\cdot 10^{24}\ kg\cdot m^2/s^2 \quad for \quad \Delta E \quad (T_q),
\end{aligned} \tag{21}$$

As you see, the uncertainties of quanta are big and we can not measure them. These values ΔE, ΔR, appears when are appeared in the first quantum of time T_q . The ΔM, ΔQ not appeared yet. They are equivalent the given ΔE.

The probability serve of inequality (20) is normal. If we take (20) in the more common form

$$\Delta I \cdot \Delta R \geq h, \quad \Delta E \cdot \Delta T \geq h, \tag{22}$$

the multiplier 4π in equations (21) become 1 and $\Delta R = c$. That means the speed in the first quantum of time equals the light speed.

Note: For getting the values (3)-(21) we also used the dimension theory and some of them may be defined with accuracy the constant factor.

Main Results and Discussion

Main result of this research (part 1 -3) is equations with result that energy can be the universal source of Universe (see Eq.(5)). Energy can produce time, mass, charge and volume. The same role/factor also can act as time (see Eq. (3)). All main components of Universe (size, matter, energy, volume, time, charge) are closely connected and can transform from one to another.

That means at the foundation of the Universe is ONE factor, which creates our diverse world.

The reader can ask: How we can convert time to energy? I can ask a counter question: The equation $E = M c^2$ (here M is mass) was open about hundred years ago. In that (past) time nobody could answer: How to convert the matter into this huge energy using this equation? Only tens of years later the scientists opened that certain nuclei of atoms can convert one to another, significantly change their mass and emit or absorb such quantity of energy. In 2006 the author offered the method which can convert any matter to energy with according to the equation $E= mc^2$ [5] – [6].

In Universe (Part 1)[1] author has developed a theory, which allows derivation of the unknown relations between main parameters (energy, time, volume, matter) in Universe. In given part 3 he added charge as main parameter in this theory. He finds also the quantum (minimal values) of energy, time, volume and matter and he applied these quantum for estimations of quantum volatility and the estimation of some values of our Universe and received both well-known and new unknown relations.

Only time and experiments can confirm, correct or deny the proposed formulae.

The authors other works closest to this topic are presented in references [1] – [7].

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Short biography of Bolonkin, Alexander Alexandrovich (1933-)

Alexander A. Bolonkin was born in the former USSR. He holds doctoral degree in aviation engineering from Moscow Aviation Institute and a post-doctoral degree in aerospace engineering from Leningrad Polytechnic University. He has held the positions of senior engineer in the Antonov Aircraft Design Company and Chairman of the Reliability Department in the Clushko Rocket Design Company. He has also lectured at the Moscow Aviation Universities. Following his arrival in the United States in 1988, he lectured at the New Jersey Institute of Technology and worked as a Senior Scientist at NASA and the US Air Force Research Laboratories.

Bolonkin is the author of more than 200 scientific articles and books and has 17 inventions to his credit. His most notable books include The Development of Soviet Rocket Engines (Delphic Ass., Inc., Washington , 1991); Non-Rocket Space Launch and Flight (Elsevier, 2006); New Concepts, Ideas, Innovation in Aerospace, Technology and Human Life (NOVA, 2007); Macro-Projects: Environment and Technology (NOVA, 2008 LIFE; Human Immortality and Electronic Civilization, 3-rd Edition, (Lulu, 2007; Publish America, 2010): LIFE. SCIENCE. FUTURE (Biography notes, researches and innovations). Scribd, 2010, 208 pgs. 16 Mb. http://www.scribd.com/doc/48229884 ; Innovations and New Technologies. Scribd, 2013. 309 pgs. 8 Mb. http://viXra.org/abs/1307.0169.

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