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SUMMARY
Some main issues of alternative evolutionary theory of matter and Universe origin developed by the author are presented in a popular form. A known effect of 'the red shift' is explained on the basis of gravitational forces. Meanwhile «the red shift» forms the basis for «the great explosion» modem theory of the Universe formation and development.

The evaluation of mass and dimensions of visible Universe is given. These data coincide with experimental data well enough.

HOW MUCH DOES THE VISIBLE UNIVERSE WEIGH ?
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In the monograph «Evolution and Origin of the Matter»[l] the evolutionary model of continuously developing Universe is presented, where physical space is considered as an infinite empty medium. This medium is unstable in reference to the fluctuation appearance as the space is infinite and the propagation velocity of its disturbances is finite and equal to the light velocity.

Fluctuations are characterized by the value of «space intensity», i.e. by the potential energy which defines the deviation degree of the given space field from the equilibrium state (absolute emptiness) and is identified as gravitational field.

In [1] it is proved that the matter and the energy is one and the same. Consequently energy has the property of sluggishness. So the intensity (as small as it is wished) appeared in a finite space volume is decreased as the space tends to the equilibrium. But it does not disappear and turning over the equilibrium state changes only the intensity sign becoming the source of spherical gravitational waves.

A period of space driving began from these processes, i.e. accumulation of potential energy in the form of gravitational waves, the overlapping of which leads to a continuous increase of their amplitudes. The superposition principle imposes the limitation on their mutual suppression. The assumption of the limiting value availability for space intensity defined by the space itself leads to the space «breakdown». It is expressed in the energy transfer across gravitational waves, i.e. to the kinetic energy birth. It leads to the birth of stable toroidal formations which are the simplest elementary particles (relic radiation T=3°K), from which photons, electrons and protons, etc. are formed.

Electromagnetic waves are considered as gravitational waves which starting from the millimeter range carry photons, i.e. chains of elementary particles. That is why electromagnetic waves express themselves as waves in one processes and as particles in

others.

The appearance of elementary particles, i.e. preserved kinetic energy, being in a small space volume, deforms this space, forming a gravitational field. It is spread as any perturbation of the space itself with light velocity. Kinetic energy forming the other particle having occurred into this nonuniform gravitational field is added to the potential energy of this field.

The centifugal force from the unstable part of all energy which forms the particle is the gravitational force directed along the gradient of maximum intensity.

All other interactions are only manifestation of the gravitational interaction.

The appearance of «butterfly-tie» objects logically arises from the theory.

These objects, for example 3C236 [2], are observed on the edge of visible Universe and existed several billion years ago. Galaxies pairs were born from the given objects. These pairs oscillate relative to the general mass centre whereas in a global scale the Universe is uniform and stationary.

«The red shift» in hydrogen spectrum registered from these objects being on the edge of the visible Universe may be explained not by scattering of galaxies but by the gravitational interaction of electromagnetic radiation with masses M_1 and M_2, M_i and M_2 being the masses of the visible Universes for two photons in this radiation (see Fig.l). This interaction is considered at the radiation motion from the edge of the visible Universe (point M_i) to the Earth (point M - the Earth being the centre of our visible Universe).

Let us assume the matter density in all infinite space as constant and approximately equal to the matter density of our visible Universe. It is apparently true as on the basis of the «butterfly-tie» object dimensions the birth time of electromagnetic particles inside them does not exceed tens million years. The disposition of these objects at the periphery of the visible Universe points to the fact that they have been formed approximately in one and the same time in all infinite space. So, the gravitational interaction force of the photon having mass m_b from radiation spectrum of hydrogen atom with the visible for it Universe having mass M_i, is equal to:

$$F_1 = \frac{G \cdot M_1 \cdot m_1}{x^2},$$

where: G - gravitational constant;

M_i - mass of the Universe visible for the photon mi at present and equal to the mass of our visible Universe M;

x - the photon way length from the radiator to the Earth (observer).

Then for the next photon lagged behind for the wave length A, the interaction force with the mass Mi is equal to:

$$F_2 = \frac{G \cdot M_1 m_2}{(x - \lambda)^2}.$$

The difference of applied forces will be at $m_1 = m_2 = m$ and $M_i = M$ is equal

$$\Delta F = GmM \left(\frac{1}{(x - \lambda)^2} - \frac{1}{x^2} \right)$$

or

But as $\dfrac{\lambda^2}{x^2} << \dfrac{2\lambda}{x}$, then

$$\Delta F \approx \frac{GmM}{x^2} \left(\frac{1}{1 - \dfrac{2\lambda}{x}} - 1 \right)$$

or

$$\Delta F \approx \frac{GmM}{x^2} \cdot \frac{2\lambda}{x - 2\lambda}$$

As $x - 2\lambda \approx x$ we will obtain

$$\Delta F \approx \frac{2GmM\lambda}{x^3} .$$

As photons m_1 and m_2 interact in the same way with the Universe having the mass $M_2 = M$ then the total force acting on the pair of photons m_1 and m_2 and increasing the distance between them is defined as:

$$\Delta F \approx \frac{4GmM\lambda}{x^3} .$$

(1)

The mass of the Universe visible for the photons m_1 and m_2 was increasing with the increase of the Universe volume:

$$M = \rho V = \rho \frac{4}{3} \pi x^3 ,$$

(2)

where : ρ - matter density of the Universe,

V - volume of visible Universe, x - constantly growing radius of the Universe.
Then, if we substitute into (1) instead of mass M its value (2) we will obtain

$$\Delta F = \frac{16\pi G m \lambda \rho}{3} .$$

As

$$F = ma = m\frac{dv}{dt} = m\frac{dv}{dx} \cdot \frac{dx}{dt} = mc\frac{dv}{dx} ,$$

then

$$mc\frac{dv}{dx} = \frac{16\pi G m \lambda \rho}{3} ,$$

where v - velocity of m_1 motion relative to m_2,
a - corresponding acceleration.
Whence

$$v = \frac{16\pi G \cdot \lambda \rho}{3c} \int_0^x dx ,$$

i.e.

$$v = \frac{16\pi G \cdot \lambda \rho x}{3c} .$$

(3)

According to (3) change of the distance $\Delta\lambda = vt$ between photons m_1 and m_2 for the time t is determined as

$$\Delta\lambda = \frac{16\pi G \cdot \lambda \rho \cdot xt}{3c} ,$$

that makes possible to define

$$\frac{\Delta\lambda}{\lambda} = \frac{16\pi G \rho \cdot x \cdot t}{3c} .$$

(4)

(4) is a relative increase of the wave length λ as a result of gravitational interaction of

photons m_1 and m_2 with masses M_1 and M_2 of the visible for these photons Universes. (4) is numerically equal to the wave length increase depending on the velocity v ' of the quasi escape of the radiator (the value of the red shift)

$$\frac{v'}{c} = \frac{16\pi G\, \rho\, x\, t}{3\,c} \tag{5}$$

v' at the path $L = ct = 1$ megaparsec $= 3,086\cdot 10^{22}$ m passed electromagnetic radiation is Hubble's constant H which is equal

$$H = \frac{16\pi G \cdot \rho \cdot x \cdot L}{3c} = 55 \, ^{km}\!/_{sMegaparsec} \tag{6}$$

The observable relative wave length increase from the radiator having arrived to the Earth from the edge of the visible Universe at $t = \dfrac{x}{c}$, is equal to 0,5 [3].

According to (5) and (6) we will get the equation system making possible to define the density and the radius of the visible Universe:

$$\begin{cases} \dfrac{16\pi G \rho \cdot x \cdot L}{3c} = 55000, \\[2mm] \dfrac{16\pi G \rho x^2}{3c^2} = 0,5. \end{cases}$$

Whence
$$x = \dfrac{0,5 \cdot 3 \cdot 10^8 \cdot 3,086 \cdot 10^{22}}{55000} = 8,4 \cdot 10^{25}\ m = 8,8 \cdot 10^9\ light\ years$$

and
$$\rho = \dfrac{55000 \cdot 3c}{16\pi G x \cdot L} = 5,7 \cdot 10^{-27}\ kg\!\!\Big/\!\!{}_{m^3}.$$

The mass of the visible Universe now is equal to:

$$M = \dfrac{4}{3}\pi \rho x^3 = 1,4 \cdot 10^{52}\ kg$$ that coincides with modem ideas [4] $M=10^{52} - 10^{53}$

kg and confirms with sufficient accuracy that the Universe is uniform and stationary in global scale. Hubble's constant characterizes the gravitational «red shift» and it can be called a constant only conditionally, as in a time:

$$t = \dfrac{x}{c} = 8,8 \cdot 10^9\ light\ years$$

from the elementary particle (the matter) formation commence to the present moment Hubble's constant has changed from zero to the modem value

$$H = \dfrac{16}{3}\pi G \rho t \cdot L = 55\ km\!\!\Big/\!\!{}_{s \cdot Megaparsec}$$

Hubble's constant is a function of time and does not depend on the location of the observer in an infinite Universe for whom the visible Universe is one and the same everywhere.

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