Article

The Unity Principle: The Key to Explaining Shocking James Webb Telescope Observations

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ABSTRACT

The results of observations made by the James Webb telescope are shocking for current cosmology. They show that very distant galaxies, from which light comes from the distant past of our universe, when its age was only about 300-500 million years since the beginning of its expansion, are just as mature as galaxies located relatively close. For such young galaxies, this is unimaginable from the point of view of current theories of their formation and development. One possible way out of this situation is a new cosmological model based on the discovery of the dialectical Unity Principle.

Keywords: Universe, cosmology, James Webb Telescope, unity principle, redshift, space-time Equation.

1. Introduction

The shocking results of the observations of the James Webb Telescope (JWST) require the creation of a new cosmological model of the universe, based on its true knowledge resulting from the discovery of the Principle of Unity, which allows to reveal the real cause of the redshift, to derive the correct formula for its calculation and to determine the correct age of the universe as well as its age from which light comes to us from the most distant galaxies. Derivation of the Unity Principle based on dialectical logic is presented in my several publications ([1], [2], [3]).

2. Definition of the Unity Principle

The essence of the Unity Principle can be expressed as follows: The entire "Being", including its physical reality, is built of elementary bipolar relations of counterparts (quantum dipoles, quantum connections (+/-)), where every positive pole "+" creates relations to all negative poles "-" of the Universe (and this relation is reciprocal).

That is, each quantum dipole is connected to the entire Universe and every object created from quantum dipoles is connected to all other objects in the Universe due to direct quantum connections (+/-). An elementary quantum dipole (connection) is an elementary quantum of space. Therefore, the volume of space is dictated by the number of elementary quantum connections.

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Opposite poles of the quantum dipole (+/-) attract and repel each other, manifested as vibration - oscillation. Repulsion and attraction are two opposite forces, through which both counterparts are in mutual motion. This motion is the energy of the quantum dipole. Therefore, energy is a measure of mutual attraction and repulsion of counterparts.

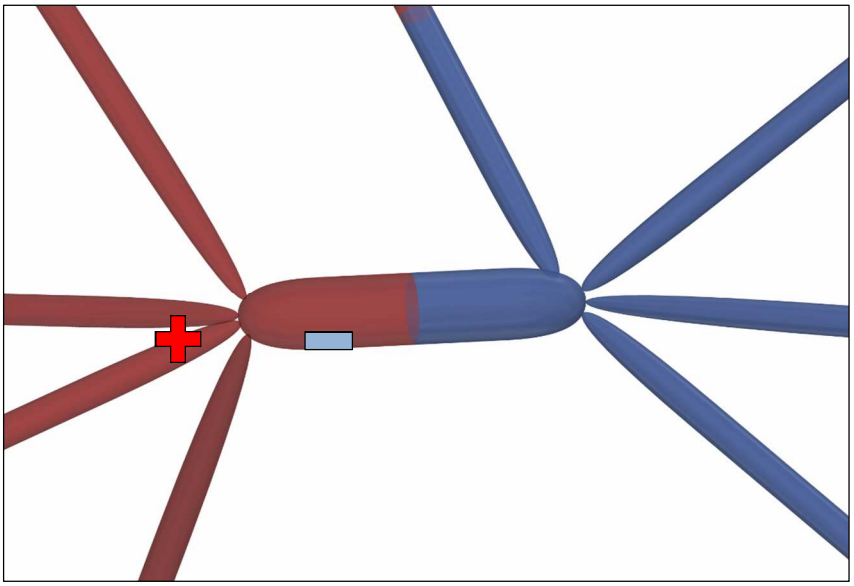


Fig. 1. Bipolar connections +/- representing elementary quantum connections (dipoles) from which the whole reality (the Universe) is created.

3. The Photon: An elementary quantum dipole (+/-)

A photon is both a particle and a wave. How is this possible? What is the solution? The photon as the elementary quantum of free energy clearly shows the bipolar nature of the whole Being.

The photon as a quantum of radiation (light) is a free quantum dipole (+/-) which, due to mutual attraction and repulsions of its opposite poles, performs permanent oscillation (vibration, pulsation) manifesting externally in flight as an electromagnetic wave. This is a real and factual explanation of the "wave-particle" duality of light, because only the bipolar dynamic unity of counterparts can lead to the oscillation (motion, energy) of the photon.

A photon is a carrier of an elementary quantum of energy. The energy of a photon e_i as a measure of its motion (vibration frequency f_i) can only be the result of the mutual attraction and repulsion of its counterparts. Planck´s equation $e_i = hf_i$ indicates that the energy of a photon is given by its vibration rate (frequency).

The photon performs two types of motion: horizontal and vertical. Horizontal motion is its flight as a result of dragging by cosmic expansion. Vertical motion is manifested by its oscillation (rotation) due to the mutual attraction and repulsion of its opposite poles.

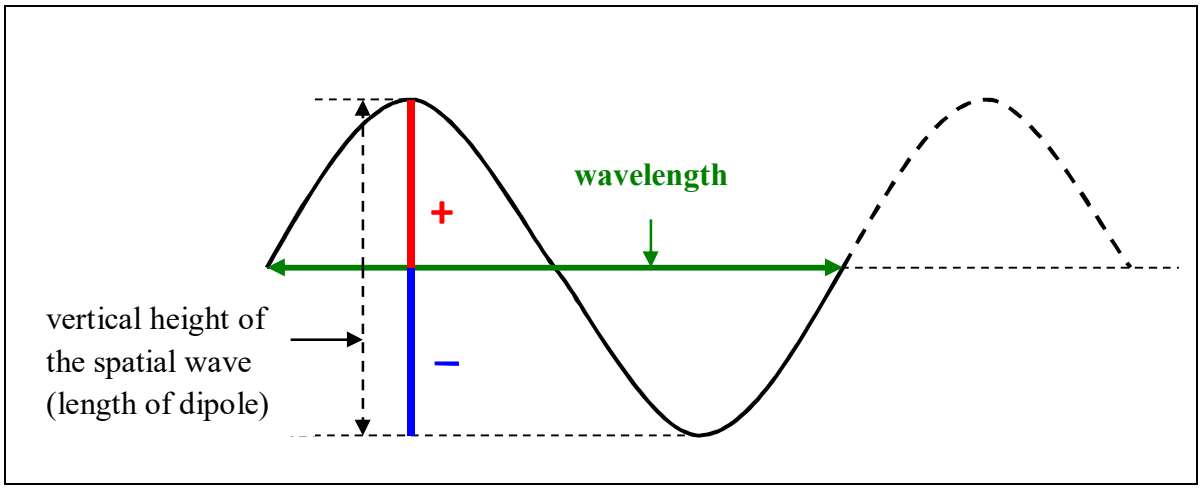
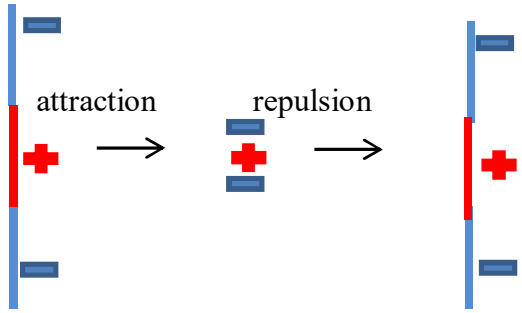


Fig. 2. Sinusoidal wave as a result of the photon oscillations

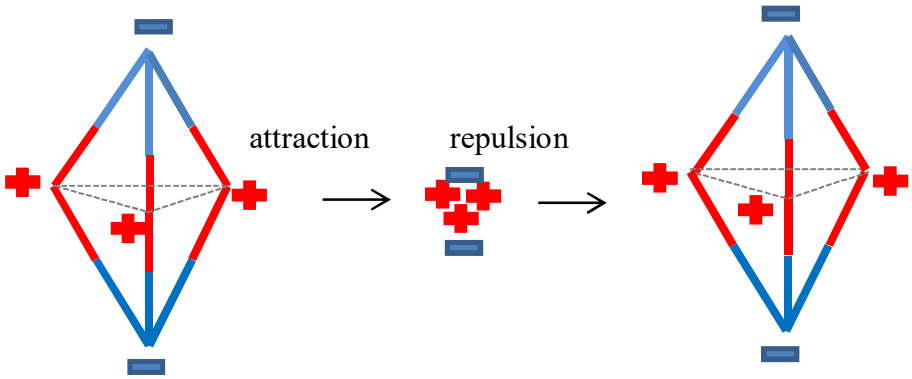
4. Basic particles

In addition to the photon, there are three basic particles that make up visible matter - an electron, a proton, and a neutron.

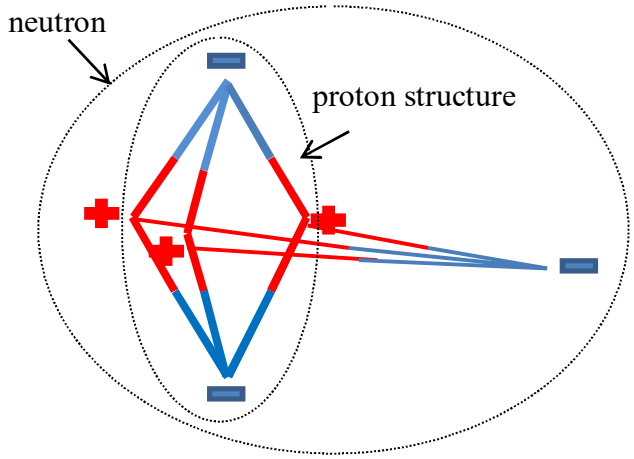
Electron e^- (+/2-) consists of two quantum dipoles:



Proton p^+ (3+/2-) consists of six elementary quantum dipoles:



Neutron n (3+/3-) in its basic state (not excited) consists of nine quantum dipoles:



Inside the neutron we see a proton structure (short and strong quantum dipoles). One negative pole is connected to three positive counterparts by much weaker and longer connections, which can be released from this structure during beta decay.

5. Cosmic expansion – cosmological model

The Universe evolves gradually, step by step, forming and ejecting new positive "+" and negative poles "-". The ongoing internal structuring and differentiation of the Universe means its cosmic expansion. The Universe is an expanding network of quantum dipoles (connections) moving from one quantum state to the next.

At the beginning of expansion, the Universe is just a simple quantum dipole **(+/-).** It then ejects, suppose, first one positive pole **(+)** and another negative one **(-)**, so after two elementary quantum jumps the Universe represents the structure **(2+/2-)**.

To simplify our analysis, we only consider and calculate quantum transitions between the symmetric quantum states when two new poles are ejected (formed) one by one. In the first quantum state the structure of the Universe is **(+/-)**, in the second symmetric quantum state it is **(2+/2-)**, in the third quantum state it is **(3+/3-)**… In the *k*-th symmetric quantum state, it has a structure **(k+/k-)** and consists of $V_k = k^2$ elementary quantum dipoles (connections). The value $V_k = k^2$ represents the volume of space given by the number of elementary quantum dipoles. The value *k* represents the number of positive or negative poles, as well as the serial number of the symmetric quantum state of the Universe, which represents the cosmic time (i.e. the number of elementary quantum double-jumps of the Universe since the beginning of its expansion).

The Universe jumps from its one quantum state *k* to the next *k+1,* forming (ejecting) new positive + and negative – poles with *2k+1* new quantum dipoles +/-. The inner structuring of the Universe that causes its cosmic expansion can be easily described using the following basic quantum space-time equation:

$$V_k = k^2$$

This equation reflects the internal division and structuration of the Universe, creating its own expanding space and flowing time. The Universe is quantized because its energy and space are localised in its elementary quantum connections and its time is given by its elementary quantum jumps. During a quantum jump, a tiny part of the energy of each quantum connection proportional to its size ($\Delta e_i = e_i(2k-1)/k^2$) is transferred to the newly formed quantum connections. The average energy per quantum connection $e = E/k^2$, as well as the energy of each quantum connection decreases proportionally to the square of the number of quantum jumps, where: E – the total energy of the universe.

Elementary quantum jumps represent the elementary changes of the Universe, its elementary quanta of motion (time), to which all other changes (motions, times) can be related. These elementary quantum jumps define the cosmic time. If we associate Δt sec to one quantum jump, then the time of cosmic expansion is:

$$t = k\Delta t$$

The basic space-time equation of the Universe, where the volume V is expressed in m^3, takes the following form:

$$V = z\,t^2, \quad where: \; z = (d^2V/dt^2)/2$$
$$dV/dt = (d^2V/dt^2)\,t$$
$$(dV/dt)^2 = 2\,V\,d^2V/dt^2$$

This is the basic equation of the spatial dynamics of the Universe expressed in real dimensional units, where the spatial volume of the Universe is directly proportional to the square of the cosmic time. In this form, space and time are presented as continuous values, but we must remember that in fact they are quantized. The expansion rate of the spatial volume dV/dt is directly proportional to the time of cosmic expansion. The acceleration d^2V/dt^2 is constant throughout the evolution of the Universe.

The three-dimensional space is self-closed, so it can be viewed as the ideal three-dimensional surface of a four-dimensional sphere, for which the following formula is valid:

$$V = 2\pi^2 r^3$$

where r - radius of spatial curvature of the four dimensional sphere.

From the relation for the circumference of the Universe $o = 2\pi r$ and previous relations we get:

$$(do/dt)^2 = -2\,o\,d^2o/dt^2$$

The relations between spatial circumference o and time t are:

$$o = u\,t^{2/3}$$
$$do/dt = (2/3)u\,t^{-1/3}$$
$$d^2o/dt^2 = -(2/9)u\,t^{-4/3}$$

where $u = (2\pi d^2V/dt^2)^{1/3}$

These equations show that the spatial circumference o increases by time, but its velocity do/dt decreases. Acceleration is negative. This means that the rate of cosmic expansion is slowing down (or "decelerating").

The length of the longest quantum dipoles, representing the highest possible distances and connecting the two opposite sides of the Universe, is equal to half the circumference of the Universe $o/2$. The rate of its increase due to cosmic expansion is the highest possible speed – the speed of light c:

$$c = (do/dt)/2 = o/3t = u\, t^{-1/3}/3$$
$$o/2 = \pi r = (3/2)\, ct$$

The speed of light represents the speed of cosmic expansion. As the cosmic expansion rate decreases, the speed of light also decreases.

The formula for the Hubble constant is: $H = (do/dt)/(o/2) = 2c/o = 2/(3t)$

The expansion time of the universe (its age) is: $t = 2/(3H)$

Current cosmology estimates the age of the universe $t = 1/H = 13{,}8$ billion years. However, if we take into account the slowing down of the expansion rate with a deceleration parameter of $2/3$, then according to the relation $t = 2/(3H)$, the age of the universe would be only 9.2 billion years.

When determining the value of the Hubble constant, the following relationship is used, using the Doppler effect:

$$H = cz/R$$

where R – estimated distance of the source of radiation, c – speed of light, z – measured redshift of spectral lines $z = (\lambda - \lambda_{emit})/\lambda_{emit} = v/c$, where λ_{emit} – wavelength of light (photon) at the moment of its emission, λ - the wavelength of this light at the moment of its reception, v - the speed with which the source of radiation is moving away from us due to the expansion of the universe. For high speeds, the relativistic formula $z + 1 = ((c+v)/(c-v))^{1/2}$ is used. However, these formulas for calculating the redshift are not correct, which is confirmed by the data obtained from the observations of the James Webb telescope, which are shocking to cosmologists. Therefore, the above relationship for determining the value of the Hubble constant is also incorrect. The formula $H = v/R$ is indeed correct, but $v \neq cz$. This is because physicists do not know what actually causes the spectral redshift in relation to the expansion of the universe, and that the application of the Doppler effect to explain it is incorrect.

The real reason for the redshift is the decrease in the energy of the quantum of radiation - the photon, which, with each quantum jump of the universe, transfers a tiny part of its energy proportional to its size to newly emerging quantum connections. For the average energy of a quantum dipole including a photon, $e = E/k^2$. By substituting $k = t/\Delta t$ we get $e = E\Delta t^2/t^2$. This means that the energy of a photon decreases proportionally to the square of space time. Not only the energy (frequency) of a photon with an average energy, but also the energy (frequency) of each photon decreases proportionally to the square of the expansion time of the universe.

The photon frequency f with average energy is: $f = e/h = E\Delta t^2/(ht^2)$

The wavelength is: $\lambda = c/f = ut^{-1/3}/(3f) = (uh/(3E\Delta t^2))t^{5/3}$

Since $uh/(E\Delta t^2)$ is an invariant with the expansion time of the universe, λ grows proportionally to $t^{5/3}$. Then the redshift is:

$$z = \lambda/\lambda_{emit} - 1 = z = (t/t_{emit})^{5/3} - 1$$

where: t – current age of the universe, t_{emit} - the age of the universe when light was emitted.

On May 25, 1999, the team of scientists around the Hubble telescope announced in the article "Hubble Completes Eight-Year Effort to Measure Expanding Universe" (https://hubblesite.org/contents/news-releases/1999/news-1999-19.html), that from the observation of 18 galaxies up to a distance of 65 million years, they established a new value of the Hubble constant at 70 km/s/Mpc with a measured spectral redshift of z = 0.00465 and determined the age of the universe at 14 billion years from the relation H = cz/R, which however is not correct. Although they determined the z/R ratio correctly, it does not say anything about how fast the source of radiation is moving away from us due to the expansion of the universe, because $v \neq cz$.

It follows from the relationship $z = (t/t_{emit})^{5/3} - 1$ that the redshift depends only on the ratio of t/t_{emit}. If we know how long the light traveled to us, that is, if we know $\Delta t = t - t_{emit}$, we can calculate the current age of the universe according to the following relationship:

$$t = k\Delta t/(k-1) \qquad \text{where } k = (z + 1)^{3/5}$$

If we substitute 65 million years for Δt and the measured value $z = 0.00465$, we get the age of the universe $t = 23.38$ *billion years*. We use the age of the universe of 23 billion years (after all, cosmologists have refined the age of the universe down from 14 billion to 13.8 billion years, which corresponds to $23.38x13.8/14 = 23.05$). This means that the age of the universe is *23 billion years* calculated from the correct formula for spectral redshift.

The actual value of the Hubble constant is $H = (2/3)t^{-1} = 9.185x10^{-19}$, which is *2.5* times lower than the currently stated value.

The new correct relation $\boldsymbol{z = (t/t_{emit})^{5/3} - 1}$ for calculating the redshift is a solution to the problem of determining the age of galaxies. So, for example, for the currently discovered most distant galaxy JADES-GS-z13-0 with a measured redshift of $z = 13.20$, from which light came to us from the period when, according to current cosmology, the universe was about 300 million years old, we get the age of the universe of 4.68 billion years. For an age of the universe of 300 million years, the correct value of the redshift is $z = 1383$. If current cosmology claims that the light came from when the universe was 300 million years old, it actually came from when it was 4.68 billion years old. We will see whether light sources with such high redshift values (z = 1383) will be available to the James Webb telescope and whether we will be able to look into such a distant past of the universe. So far, we have only looked into the period of about 5 billion years after the big bang.

Another problem of contemporary cosmology is the so-called dark energy that is said to cause the expansion of the universe to accelerate. This deceptive appearance is based on the observation that bright stars are much further away and the light from them is therefore darker than it would be if the universe were expanding uniformly. This means that the universe has expanded much more than expected. However, this is not because the universe is accelerating its expansion, but because it expanded much faster in the past and the speed of light was much greater than it is today. Cosmologists do not know that the speed of light expresses the speed of expansion of the universe. The universe is slowing down its expansion, but for the "discovery" of its acceleration, the Nobel Prize was awarded in 2011 to theoretical physicists who actually discovered the slowing down of the expansion rate of the universe and interpreted it as acceleration. Namely, the result regarding the expansion of the universe is the same. Let's illustrate this with the example of a car that accelerated uniformly from 50 km/h to 100 km/h during 1 minute of driving. It traveled the same path in one minute, i.e. 1.25 km as a car decelerating from 100 km/h to 50 km/h.

There is no need for dark energy to accelerate the expansion of the universe. It doesn't exist. The efforts of theoretical physicists to search for it are in vain - they will never discover it.

6. Conclusion

Our cosmological model is also a model of the expanding universe, but unlike the current cosmology, it takes into account the facts that result from the knowledge of the exact mechanism of the dialectical Principle of the Unity of the Universe. This model gives a clear explanation for the seemingly shocking results of the JWST telescope observations.

The Unity Principle represents a completely new paradigm in science and is the clearest manifestation of Occam´s razor. The highest complexity of the Universe is created from the utmost simplicity of bipolar relations (+/-). We do not need speculative theories to understand how the Universe works. We need to understand the precise and simple mechanism of the Unity Principle, the discovery of which means that new science and philosophy can now be built on real foundations.

> *Someday we'll understand the whole thing as one single marvellous vision that will seem so overwhelmingly simple and beautiful that we may say to each other: 'Oh, how could we have been so stupid for so long? How could it have been otherwise! '.* J. A. Wheeler

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