The Theory of Unity of the Whole and its Parts

Branko Zivlak, *bzivlak@gmail.com*

Abstract: Proton is obtained as an inevitable consequence of the existence of the universe.

Keywords: Universe, Cycle, Proton shift, Physical constants

1. Introduction

This theory arises from the following statements:

- *Parts are dependent on the whole (Universe) and are also an integral part of the whole, therefore, the whole is also dependent on the parts!*

  That statement falls under one of the interpretations of Mach's principle [1].

- *The quantum character of phenomena is connected to the relations between the whole and its parts.*
- *Mass is piece of physical space which rotates has conserved energy of rotation* [2].
- *The matter is in constant motion, which can be described by cycles of different magnitudes.*

The above statements can be checked through the introduction of mathematical and physical constants [3], see Appendix.

The methodology used for obtaining relations among physical constants can be found in my two essays previously published at FQXi contests [4] and [5]. In this article I am absolutely complying with that methodology and the results obtained through its use.

The groundbreaking novelty in this article is an addition of a crucial new formula which connects mathematical and physical constants, and which has its physical explanation. The same results were obtained in [5, formula (7)].

2. Towards a Mathematical Interpretation of Nature

The following dimensionless constant **k** we define:

$$k = 2^{\exp(2\pi)/2} / \left(\frac{2\pi c^4 \lambda_p^2}{G^2 m_p^2} \right) = 55.915751008 \tag{1}$$

See Appendix for the meaning of key mathematical and physical constants.

From [5, formula (7)] we have (2).

$$\Delta p = 2 - \frac{1}{\alpha\mu + 2} = 1.9350609435 \qquad (2)$$

Where: α - fine-structure constant, μ - proton-to-electron mass ratio, see Appendix.

The quantity Δp is called the proton shift in all my previous publications. The significance of formula (2) is explained in [5] and [6].

For the purpose of this article, let's present mass of point cy/2:

$$m_{cy/2} = m_p * 2^{-\Delta p} \qquad (3)$$

The significance of formula (1), arising from it is explained below:

According to Ruđer Bošković, [7 part I 7.]:

"Prima elementa materiae mihi sunt puncta prorsus indivisibilia, & inextensa, ... "
"The primary elements of matter are in my opinion perfectly indivisible & non-extended points, ... "

Let's define that masses bigger than (3), represent "**matter dominant Universe**", while smaller are "**radiation dominant Universe**". So how come that non-extended mass $m_{cy/2}$ is final? The explanation is just like in the case of the barycenter in cosmology, where the collective mass of stars and planets moves as if the entire mass is in the barycenter, even though does not have to be any mass there.

Of course, real mass or a particle which would be exactly that big cannot be expected to exist because of the very fact that it is non-extended. But, there are so many particles whose masses are very close to this mass. Our task is to show how we have come from non-extended to real extended mass, for which proton is essential in formation of the material world and consequently of the relations represented by physical constants in that world.

Let's consider that the transition from $m_{cy/2}$ to m_p is a transition from a non-expanding point into the real volume, during the first cyclical movement (hence 2π). Therefore:

$$kl = 2^{\Delta p} = 3.8239428011 \qquad (4)$$

That is transition to linear form in material world, and then:

$$kv = kl^3 = 2^{3\Delta p} = 2^{6-3/(\alpha\mu+2)} = 55.915751008 \qquad (5)$$

That is transition to volume. We see that in (1) and (5) is same value, kv=k.

Also, we can say that the parameters of the Whole, G, c and the parameters of the proton are interconnected by formulas (1). Furthermore, we can determine other non-extended masses and important real parameters, as in [5, Table 2].

3. Relation between Fundamental Physical Constants

In [5] we saw that the significance of the formula (2) is confirmed by a large number of its applications and correct results which have even surpassed the accuracy of CODATA reports. Here we got the formula (1) from the relation between fundamental physical constants, which gives the same result for Δp as (2). So, if we equalize (1) and (5), we get:

$$2^{e^{2\pi}/2-6+3/(\alpha\mu+2)} * G^2 m_p^2 / 2\pi c^4 \lambda_p^2 = 1 \qquad (6)$$

If we apply the values from the Appendix, the result differs according the accuracy of input data. If we express this formula through G, we get a much more accurate value for G [8].

Notice that in (6):

> ***physical constants are equal to mathematical constants, hence it cannot be said that they are derived from mathematical constants, rather, they are in the immanent relation of a whole and its parts.***

In other words, they are of the magnitude that they are, they were and always will be.

Then, where do all these relations originate from? The answer: from irrational mathematical constants, quote: *"In mathematics, an irrational number is any real number which cannot be expressed as a fraction p/q, where p and q are integers, with q non-zero. It is therefore not a rational number. …*
Thus, space-matter consists of irrational points, so it is necessary to speak of the form and distribution of these points to produce both continuous and discrete space-matter" [9, p2].

The results in this article have been obtained through the analysis of well-known physical relations. The work methodology and the principles applied are also well-known and described in my previous publications. The proton has been obtained as an inevitable consequence of the existence of the universe as a whole.

I used the mathematics just to the extent that it is used in significant physical formulas, such as for example 2pi and *e* in Planck's relations. Here is applied combination of these two mathematical constants, exp(2pi). There were no attempts to numerologically obtain any physical constant as a mere function of 2pi.

Conclusion

The nature does not recognize our division into mathematics and physics. For the nature those two are the same, everything is the same. That is why what we today call "science" thinkers once called the "phylosophy of nature", as for example in the title [7]. The formula (6) is part of such understanding and confirms it. In the Theory of the Unity of the Whole and its Parts, the so called *"matter dominant Universe"* and *"radiation dominant Universe"* coexist in every point in time, so there is no room for weird understanding of their change during the history of the Universe. Here, these two integral parts of the Universe are divided in the framework of the Cycle: *matter dominant* in the domain *(0, $e^{2\pi}/2$)* and *radiation dominant* in the domain ($e^{2\pi}/2, e^{2\pi}$), hence that is the only way for dominance of one over the other.

From the level $e^{2\pi}/2$ to zero there is buildup of matter, first protons at level **p**, then molecules, then more complex structures, all the way to the Universe as a whole at level **0**.

The article shows that gravitational constant G is the product of a relation between the whole and its part. We can say that G and c represents a whole. From (6) we conclude:

The universe is inevitable;

Universe is eternal;

Mass and space of the universe are finite;

Universe has no shape.

The applied methodology leads to simple relations of the whole and its parts, therefore, I still consider that all the relations and statements featured in [5] are true.

To confirm: Mathematics in my work is the result, not the starting point.

Novi Sad, March 2017.

Appendix

Mathematical constants: $2\pi = 6.28318530718$; $\exp(2\pi)=e^{2\pi}=535.491655524765$

Physical constants:

CODATA 2010 internationally recommended values of the Fundamental Physical Constants:

α	Fine-structure constant	0.007 297 352 5698	0.000 000 000 0024
c	speed of light in vacuum	299 792 458	(exact) m s^{-1}
G	constant of gravitation	6.673 84 e-11	0.000 80 e-11 m^{3}kg^{-1} s^{-2}
λ_p	proton Compton wavelength	1.321 409 856 23 e-15	0.000 000 000 94 e-15 m
m_p	proton mass	1.672 621 777 e-27	0.000 000 074 e-27 kg
μ	Proton-electron mass ratio	1836.152 672 45	0.000 000 75

REFERENCES:

[1] http://en.wikipedia.org/wiki/Mach%27s_principle [last modified on 24 September 2016]

[2] D. B. Semyonowich, Mass as result rotate piece of physical space, http://gsjournal.net/Science-Journals/Research%20Papers/View/6710

[3] http://physics.nist.gov/cuu/Constants/, *CODATA internationally recommended values of the Fundamental Physical Constants,* values of the constants (2010)

[4] Zivlak B, Bit, Cycle, Dimensionless, It, http://fqxi.org/community/forum/topic/1847

[5] Zivlak B, Mathematical Connection Among the Structures of Universe
http://fqxi.org/community/forum/topic/2358

[6] Zivlak B, Cycle towards Methodology of Everything,

http://gsjournal.net/Science-Journals/%7B$cat_name%7D/View/6283

[7] Boscovich J. R.: (a) "Theoria philosophia naturalis redacta ad unicam legem virium in natura existentium", first (Wien, 1758) and second (Venetiis, 1763) edition in Latin language; (b) "A Theory of Natural Philosophy", in English, The M.I.T. Press, Massachusetts Institute of Technology, Cambridge, Massachusetts and London, England, first edition 1922, second edition 1966.

[8] Zivlak B, Universal Gravitational Constant Via Proton, http://vixra.org/abs/1310.0018

[9] D. B. Semyonowich, The Law of Constancy of a Stream of Forces, http://gsjournal.net/Science-Journals/%7B$cat_name%7D/View/3565