

**New Research Method into the Nature of Energy and Matter:
The Law of Information Structure**

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The author of this article proposes the hypothesis that time-space initially by itself, objectively, has a unified nature, a dynamic unified shape that can be observed on the levels of micro and macro worlds. This is already more than time-space, this is time-space-energy-matter or the unified primary elementary particle (UPEP), the existence of which is believed to be a new scientific law.

This hypothesis can be proven by designing a dynamic time-space-energy-matter model and consequently tested by its application towards explaining many contemporary questions of quantum physics and cosmology.

The author proposes that the only acceptable and only possible origin (first primary source) of energy-matter is locked-in time, i.e. time moves in circular fashion in the space or it is a certain force that is locked onto itself. The key characteristics of such time is, naturally, its perpetual motion. Of course in space, it can be positioned in any shape. However its core concept can be depicted using the following model.

The locked-in time is divided into two pairs of forces. The first pair: time with counter-clock-wise spiral. And the second pair as its counterpart is time with clock-wise spiral. The second pair of forces is seen as a paradox: simultaneous compression and stretching of the space. The energy flows from the compression phase into stretching phase and vice versa.

The resulting force is like a logarithmic spiral, because it has the characteristics of infinite spinning. Ultimately the time-space spiral is formed, the architecture of which is similar to the architecture of the DNA molecule as well as the guitar string.

The degree of the compression-stretching of time-space is equal to 10/7 in one full circle of locked-in time. The next paradoxical characteristics of locked-in time under conditions of its infinitely small size is that it simultaneously has two shapes – a circle and a line (diameter of the circle). The relationship between the two shapes is known as π .

Hence such an infinite motion – the model of locked-in time can be formalized using the following formula:

$$\frac{10}{7} = t \text{Log}_{\pi}(k\pi),$$

where $(k\pi)$ - is the change in π during the period t ,
brackets are used to better illustrate that π is changed by a certain coefficient k ,
 t – is the period of time during which the spiral is formed. It is the concrete non locked-in time that is observed by us.

The essence of the formula is that it shows the relationship between the general (π) and part of the general ($k\pi$). It is almost identical to the Hartley's formula. I hope that the resulting formula is supported by sufficient evidence and argumentation to be hailed *the formula of information structure* or *the law of information structure*.

This particular law forms all four types of fundamental interactions currently known in science and all elementary particles that are involved in such an interaction. Exploiting the given formula, we can describe the interactions and the interacting particles, hence allowing the assumption that they serve as the various signs of a single force, single particle, and single law.

Let us test the validity of expressed assumptions of the Standard model by explaining the masses of leptons and quarks. The Standard model in general, as I see it, is a certain primary-atom or energy-matter as a whole. It consists of three so-called *primary-electrons* and of three *primary-nuclei*, which are in turn are elements of the primary atom.

The general principles of the element composition are as follows. Electron and its analogues (heavy electron and tau) are connected with the corresponding neutrinos (electron neutrino, heavy electron neutrino and tau neutrino). The electron-neutrino mass equals the minimal positive value of the logarithm. Quarks are connected as a sum of quarks that form the proton and neutron or the nucleus as a whole.

Thus electrons are formed with the following sets of leptons:

- Electron + electron neutrino (mass assumed as 1,1 MegaElectronVolt/second²)
- Heavy electron + heavy electron neutrino (mass approximately is equal to 106 MegaElectronVolt/second²)
- Tau + tau neutrino (mass approximately is equal to 1797 MegaElectronVolt/second²)

The nucleuses are formed with the following sets of quarks:

- Three U-quarks + three D-quarks (mass is equal to 27 MegaElectronVolt/second²)
- Three C-quarks + three S-quarks (mass is equal to MegaElectronVolt/second²)
- Three T-quarks + three B-quarks (mass is equal to 537900 MegaElectronVolt/second²)

The aggregate mass of leptons has about 1904 MegaElectronVolt/second², and 542127 MegaElectronVolt/second² of quarks. The total mass of all leptons and quarks in the *primary-atom* is about 544031 MegaElectronVolt/second².

The six listed elements can be viewed as certain energy thresholds of a single formula:

$$\frac{10}{7} = t \text{Log}_{\pi}(k\pi) ,$$

Where the value of t ranges from certain maximum positive value to 10/7. Let us calculate the elements sequentially as their masses increase. If we find the logarithms of masses for each element that composes the *primary-atom* with its total mass of 544031 MegaElectronVolt/second², we will get the following approximate values for t :

- 10/0,05
- 10/1,8
- 10/2,5
- 10/4
- 10/4,4

- 10/7

The general pattern that explains the masses of the elementary particles can be evidently traced. The shifts of certain numbers in the denominator is most likely case-sensitive:

- 10/1
- 10/2
- 10/3
- 10/4
- 10/5
- 10/6

In my opinion, the main causes of the shifts are the following:

- there are no firmly fixed parameters in the quantum world. Everything has only an approximated value. Everything flows and everything changes, even the value of π .
- the process of mass formation of elementary particles is influenced by the triune force – concurrent influence of forces with positive, negative and electrically neutral charges.

These two factors cause the shifts in masses of elementary particles.

I hope that this is the way towards understanding the essence of the Higgs boson particle. As a preliminary, its nature can be described in the following terms. This is something averaged of all fundamental forces of interaction (gravitational force is included a priori). The mass of the quantum can simultaneously be equal to the known masses of calibration bosons.

The given statement can be tested by taking the logarithm of the W-boson masses to separate masses of quarks using the original formula:

$$\frac{10}{7} = t \text{Log}_{\pi} (k\pi),$$

Where π - is the mass of the W-boson,
 $(k\pi)$ - is the masses of quarks.

The purpose of the formula is to show the degree of participation of the W-boson's mass in the formation of the masses of separate quarks proportionally to their energy thresholds (t):

- 10/1
- 10/2
- 10/3
- 10/4
- 10/5
- 10/6

As a result of calculations we get the following values:

- 1,4
- 0,9
- 1,3
- 1,5
- 1,5
- 1,8

The order of magnitude is the same, their variations also, most likely, can be explained.

The proposed method can be used to give the conceptual answers to other questions in quantum physics and cosmology. In particular – the nature of dark energy, if we suppose that it is the energy compressing time-space vs. the stretching energy. This method can be also applied to revise several theories, e.g. the Big Bang theory in cosmology.