

# Changes of the atoms work

(Translated from Polish into English by Maksymilian Miklasz)

**Abstract:** Changes in action of atoms can occur in people's minds, in their consciousness. After reading this article they may occur in these people, who highly regard the cause-and-effect relationships and logical thinking. Because of the article, you can find out that the properties of atoms result in a logical way from the properties of the fundamental particles of matter.

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## 1. Introduction

Changes of the atoms work ... what refers to the title? Atoms in nature always worked, they work and will work in the same way - with the simplest natural laws which operate on the fundamental level of matter. To explain the actions of atoms, so far built many theories. But using any of them we can not explain all aspects of the structure of matter and a wide range of phenomena that are associated with the construction of atoms. The reason for this is that the concepts have not their specific meanings, which would specify the existing objects in nature and their properties. And for this reason that the same basic concepts are not well defined and do not know what is their equivalent in nature, you can not use them to explain natural phenomena. An example would be energy. As a result of different treatment of this parameter, in physics there is a division on classical physics and quantum physics, but none of them does not specify what it is energy. Current theories are unable to explain what it is: an electron, matter, energy, consciousness (and after all, this is the most important), quantum, quark etc. All this logically shows the **Constructive Field Theory**.

Yes ... there is nothing to hide. Basics of **Constructive Field Theory** have also been invented by a human consciousness. But there used terms have specific and imaginable meanings, in nature behind them are hiding concrete objects, phenomena and their properties. Using these concepts can be logically describe all physical phenomena. \*1) Because descriptions of physical phenomena base on three fundamental properties of matter particles: protons, neutrons and protoelectrons. \*2)

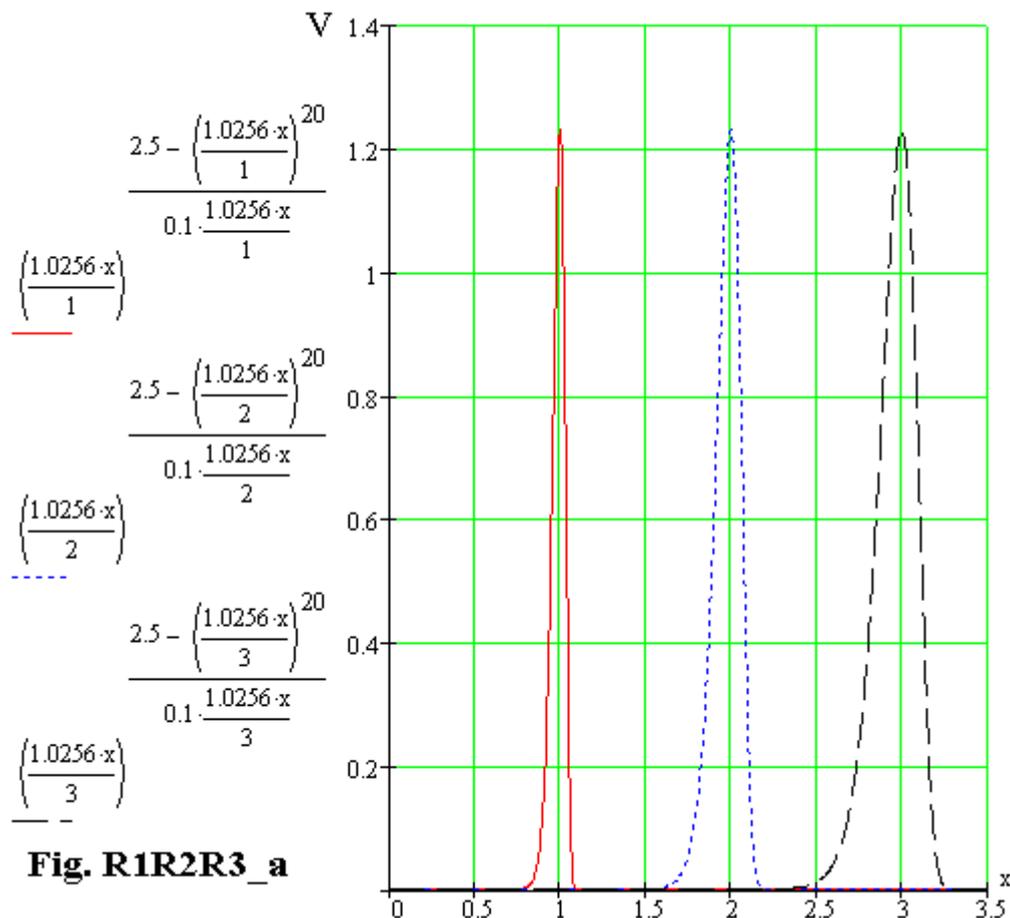
The processes in the form of changes in the atoms work will not place in the physical world. These changes in atoms will be held in minds of people who will know and understand what presents the CFT. First of all, will be a fundamental change of thinking about the atomic structures and will disappear the previous ignorance about the cause of existence of stable structures. Appears to understand that all physical phenomena originate from the parameters of centrally symmetric fields -

from the fundamental constituents of matter, briefly called particles. These centrally symmetric fields are nothing else but distribution of potentials in space - it's just the element of matter. In this distribution of potential fields – particles, we can distinguish the gravitational component and structural component. This second component exist in the form of many spherical formations that have a different radii and concentrically surround the central point of fundamental particle. These spherical formations are called the potential shells and with their participation creates a stable structure of matter and any kind of changes in matter.

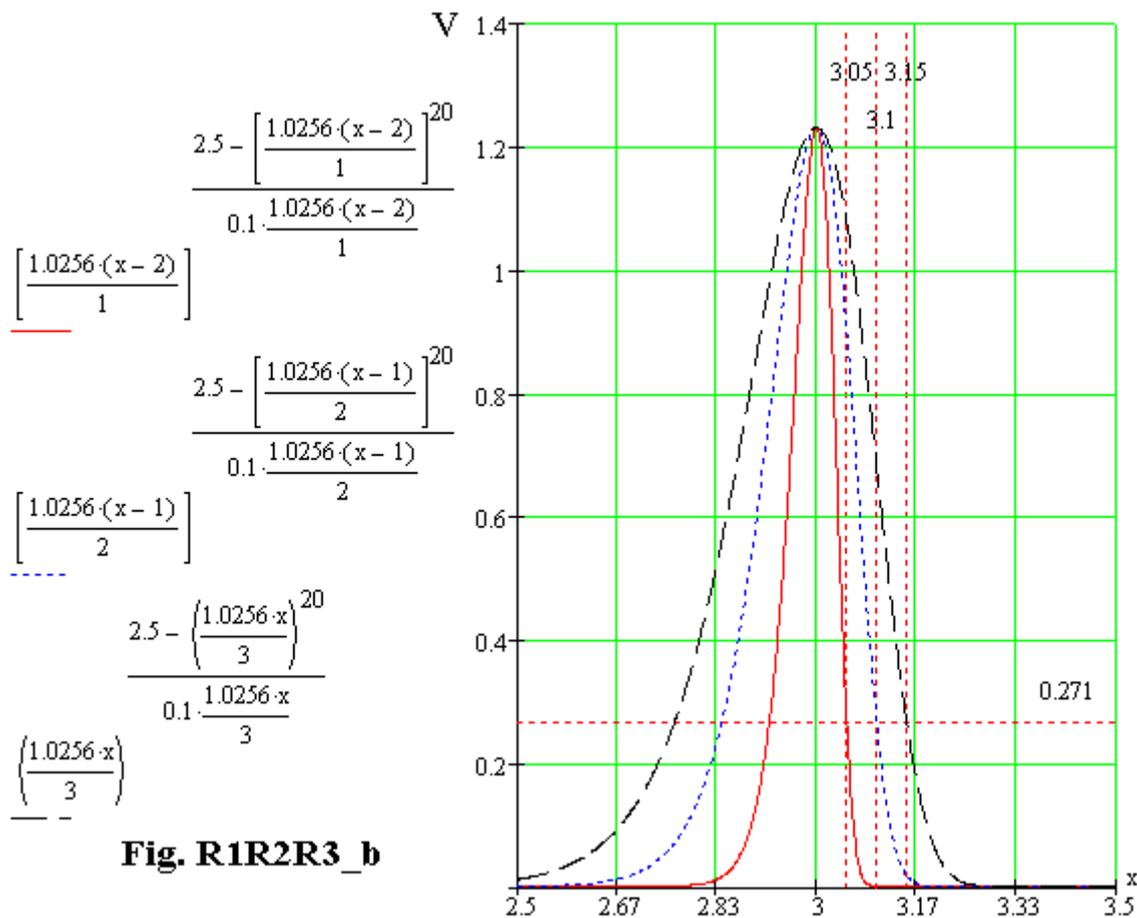
## 2. Potential shells of atoms – two families of shells \*3)

Maybe sometime in the future, someone more accurately decipher the atomic structures and know the mathematical function that will more accurately describe what is the distribution of potential on shells. For now, suffice PES function (poly-exponential summed function), which the individual components describe the distribution of potentials on the individual shells. It describes the potential shell in approximate way. In other words, it does not describe reality as it is, but it gives a picture of reality that allows you to guess how fundamental particles, atoms, molecules and so on are built.

The figure **Fig. R1R2R3\_a** shows the distribution of potential that exists on the three potential shells.



In this way changes the potential along any ray which comes out from a central point of the field. The visible change of potential occur near a maximum value of potential. The distance from center of the field-particle to extreme position of potential is called the radius of shell. In this case, the radius of three shells is equal to 1, 2 and 3. On the diagram of potential distribution can be seen a "lucky coincidence", which is characterized in that the thickness of the potential shell increases with the radius. This type of growth is shown in **Fig. R1R2R3\_b**.



**Fig. R1R2R3\_b**

In the drawing are shown graphs of the same functions describing shells of the same radii as in the previous figure. But two of these graphs (of radius 1 and 2) have been moved in such a way that the points of maximum potential overlapped with each other, and also coincided with a position on the potential of the shell of radius  $R = 3$ . This procedure is intended to enable a comparison of shell thickness. For this purpose, on the potential level of 0.271 p.u. (potential units) are marked coordinates of outer edges of shells \*4) with such value of potential. Comparing the values on the outer sides of shell it can be seen that the thickness of the potential shell increases in proportion to the value of shell radius  $R$ . The existence of this proportional increase in thickness of the potential shell for increasingly larger radius and use the mathematical function to describe the potential of atom components is the "happy coincidence" that allows to describe the structure of atoms and understand the behaviour of these atoms, when they create molecules and more complex structural systems.

Based on experimentally confirmed facts of the atoms follows that in the components of atoms - protons and neutrons - there are two families of potential shells. There are a family of shells with very small radii, which can be called the family of nuclear shells. With shells of this family, the protons and neutrons create the nucleus of atoms. There is also a family of molecular shells. These two families divide a significant difference of their radii. The size of nuclear shell radius can be estimated on the basis of the size of atomic nucleus.

In the atomic nucleus the central points of protons and neutrons are located in areas of potential shells of their neighbors. The distances between the central points of these particles are very small. These distances are approximately the same order as the radius of nucleus. Currently, the radius of nucleus is calculated according to the formula

$$r_j = r_o \cdot A^{\frac{1}{3}}, \text{ where } r_o = 1,2 \cdot 10^{-15} \text{ m}$$

$A$  is the mass number.

In contrast, the radii size of the molecular shells family can be judged on the basis of bond lengths (the distance between atoms) in molecules, crystals etc. For example, in a diatomic molecule of hydrogen the bond length is 0.74 Angstroms. As you can see, between the radius size of the nuclear and molecular shells family there is a difference of four or five rows.

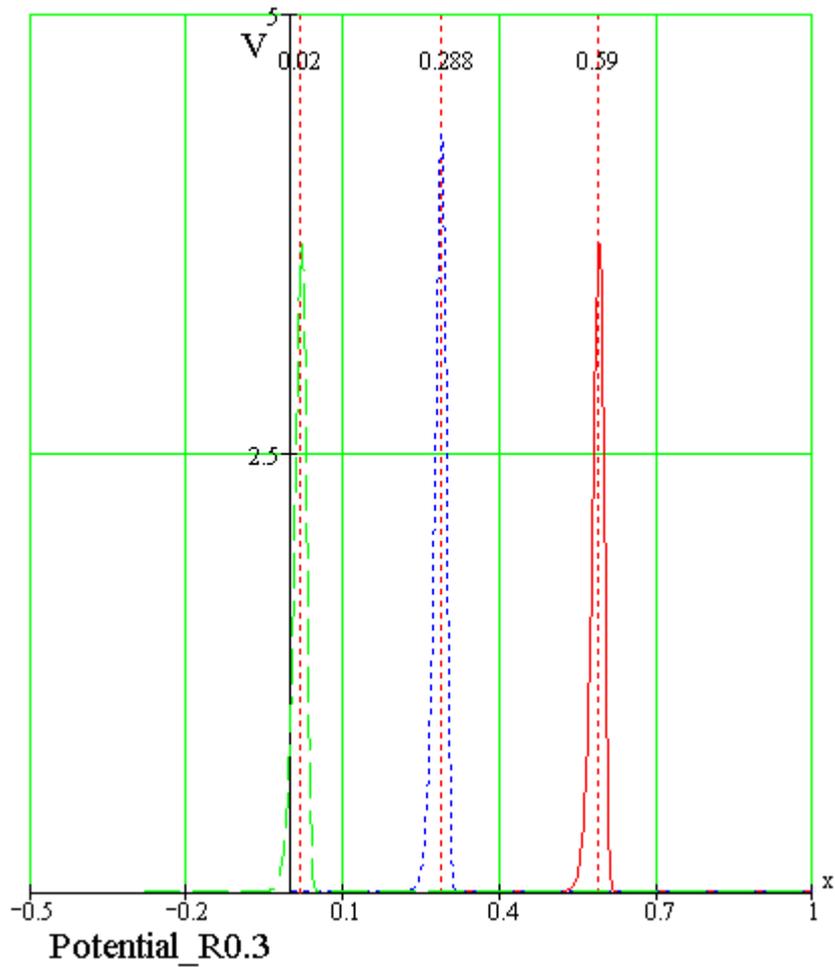
For this reason that we will also benefit from a simplified model - so that you can watch it on the computer screen - the difference of potential shells radius from different families will not be as significant. But it will be a big enough to we could understand the mechanism of interaction of nucleons in atoms and atoms together.

Because of the thickness of potential shells is directly proportional to the radius of these shells, the formation of nucleus is related to the formation of molecular shells with larger potentials. This process can be traced using several drawings in which are shown graphs of potential PES functions.

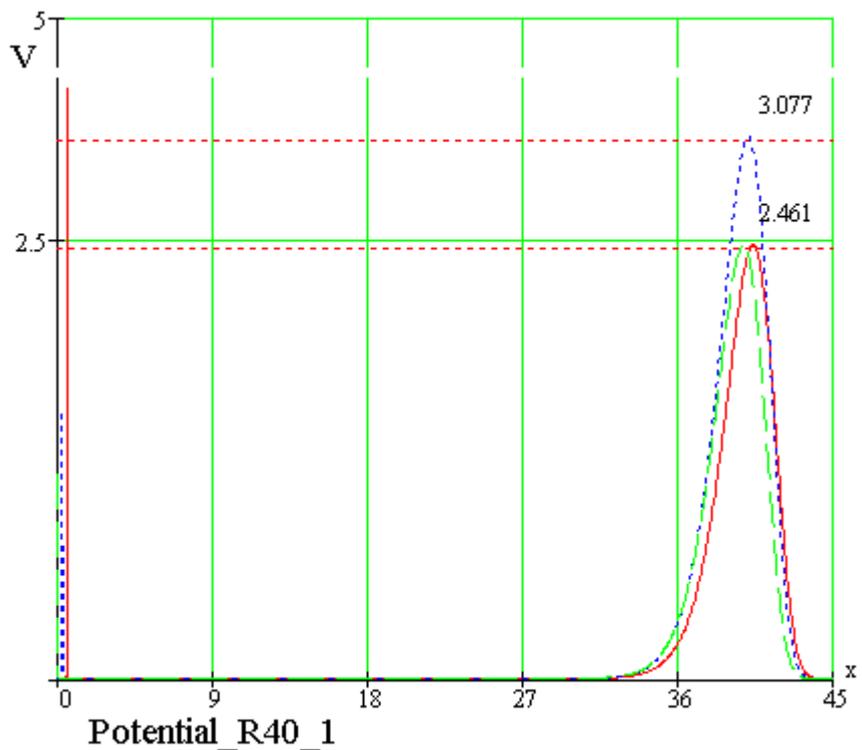
Below are shown the ingredients of PES function which are a record of potential distribution of the two shells of three different particles. One shell of each particle can be assigned to the family of nuclear shells (though not entirely, because it's a totally different scale). These particles are shown in the coordinate system in such a way that the distances between them are approximately equal to shell radius. Two of these particles have the same parameters of their own, and one bit different. This is a reference to the two types of particles - the components of atoms in nature - protons and neutrons.

$$\begin{array}{c}
 \frac{2.5 - \left[ \frac{1.0256 \cdot (x - 0.29)}{0.3} \right]^{20}}{0.1 \cdot \frac{1.0256 \cdot (x - 0.29)}{0.3}} \quad \frac{2.5 - \left[ \frac{1.0256 \cdot (x - 0.29)}{40} \right]^{20}}{0.1 \cdot \frac{1.0256 \cdot (x - 0.29)}{40}} \\
 \underline{3 \cdot \left[ \frac{1.0256 \cdot (x - 0.29)}{0.3} \right]} \quad + \quad 2 \cdot \left[ \frac{1.0256 \cdot (x - 0.29)}{40} \right] \\
 \\
 \frac{2.5 - \left( \frac{1.0256 \cdot x}{0.288} \right)^{20}}{0.1 \cdot \frac{1.0256 \cdot x}{0.288}} \quad \frac{2.5 - \left( \frac{1.0256 \cdot x}{40} \right)^{20}}{0.1 \cdot \frac{1.0256 \cdot x}{40}} \\
 \underline{3.5 \cdot \left( \frac{1.0256 \cdot x}{0.288} \right)} \quad + \quad 2.5 \cdot \left( \frac{1.0256 \cdot x}{40} \right) \\
 \text{-----} \\
 \frac{2.5 - \left[ \frac{1.0256 \cdot (x + 0.28)}{0.3} \right]^{20}}{0.1 \cdot \frac{1.0256 \cdot (x + 0.28)}{0.3}} \quad \frac{2.5 - \left[ \frac{1.0256 \cdot (x + 0.28)}{40} \right]^{20}}{0.1 \cdot \frac{1.0256 \cdot (x + 0.28)}{40}} \\
 \underline{3 \cdot \left[ \frac{1.0256 \cdot (x + 0.28)}{0.3} \right]} \quad + \quad 2 \cdot \left[ \frac{1.0256 \cdot (x + 0.28)}{40} \right]
 \end{array}$$

In figure **Potential\_R0.3** are shown the function graphs of nuclear shells and particle distribution relative to each other. The central point of the central particle (central - in the figure) is located in the center of coordinate system. The central points of the two extreme particles are displaced "left" and "right" at a distance of 0.28 and 0.29 l.u. (length units).



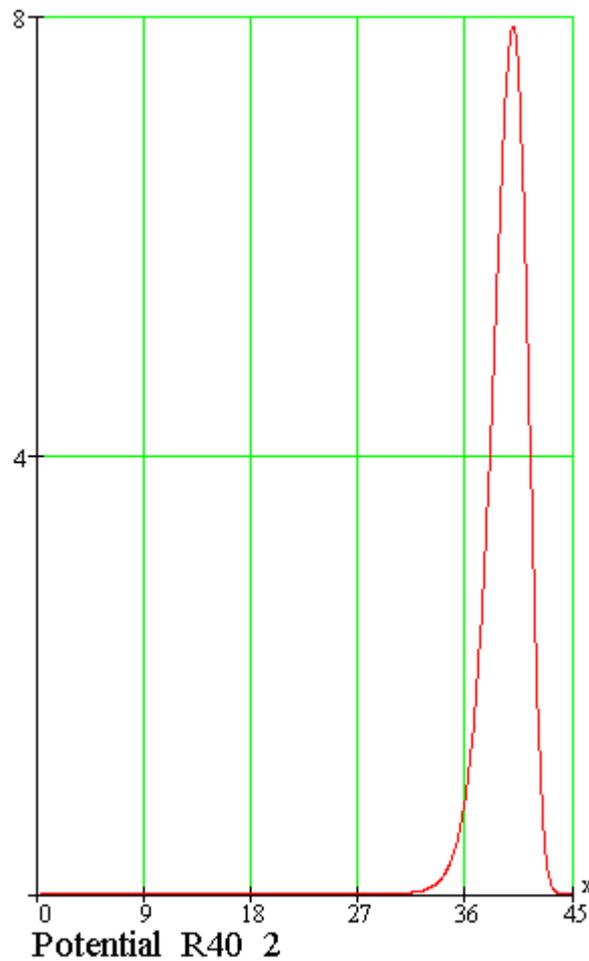
In figure **Potential\_R40\_1** are shown the function graphs of molecular shells of the same particles and distribution of these shells relative to each other. These shells are slightly offset from each other, but in this case there is an area in space, which is a common part for all three shells.



In this case, the potentials of shells add to each other, can therefore be represented as a single function, which is shown below.

$$V = 2 \cdot \left[ \frac{1.0256 \cdot (x - 0.29)}{40} \right]^{20} + 2.5 \cdot \left( \frac{1.0256 \cdot x}{40} \right) + \frac{2.5 - \left( \frac{1.0256 \cdot x}{40} \right)^{20}}{0.1 \cdot \frac{1.0256 \cdot x}{40}} + \frac{2.5 - \left[ \frac{1.0256 \cdot (x + 0.28)}{40} \right]^{20}}{0.1 \cdot \frac{1.0256 \cdot (x + 0.28)}{40}} + 2 \cdot \left[ \frac{1.0256 \cdot (x + 0.28)}{40} \right]$$

Graph of the potential function of this summed molecular shell does not differ from the shell of a single particle, as shown in figure **Potential\_R40\_2**.



For the reasons set out above, the interaction of atoms with each other, then when they are from each other at a distance equal to (approximately) the radius of the potential shell (from a molecular family), is similar to the interaction of individual particles when they are in a similar situation.

### 3. Interaction of protons and neutrons in the area of nuclear shells

The interaction of protons and neutrons is expressed in the construction of all atoms. It is not known a fact of existence in nature the atoms, which are composed solely of two or more protons (stands to reason that, together with electrons, but this will be discussed in the next section). They are also not known particles that would consist solely of neutrons - two or more of them. **With the exception of**

**hydrogen (protium) all other atoms and their isotopes consist of a mixture of protons and neutrons.** This interaction is highly expressed in the form of a high strength structure of the particles "alpha", consisting two protons and two neutrons. \*5)

These facts indicate that the protons and neutrons create the complex structures in the form of atomic nuclei, but **they can only do it together**. Therefore, these facts testify to that in terms of the construction of nuclear potential shells these particles in some way different from each other and during the formation of these complex structural systems complement each other. These shells have such field distribution that protons or neutrons alone can not create a stable structure. The situation is that, like if in their central areas in places of the existence of nuclear potential shells, protons and neutrons were unlike character in those places. So two protons (or two neutrons) repel each other and are not able to create a stable structural system. But when there is a mixture of different particles, because of the mutual attraction to each other of each proton with each neutron (the attraction to the area of potential shell) is formed as a stable structure of the atomic nucleus.

For now, we will not here go into the nuances of atomic nucleus construction. For now, it can be assumed that the nucleus are formed with the similar potential shells, such as those existing in molecular shells family.

#### **4. Vibration frequency of atoms – results of the models**

The study of behaviour of particles and atoms, when jointly interact with each other, were carried out by a computer program AtomStand.exe. The basis for the operation of computer program are the mutual acceleration of particles and atoms in accordance with the law of Galileo - namely in the field of concrete particle all the other particles, irrespective of their mass, they move with the same acceleration. This acceleration varies with distance and according to changes in the field potential of the particles.

During exercise with files .ato (which are created using AtomStand.exe) was examined changes in the behaviour of particles that occur when changing the parameters of the field in which these particles are placed. Several series of exercises was made. To simplify the process, was studied the behaviour of a test particles with mass equal to zero in potential field of the other particles, which have a specific value of mass  $m$  (expressed in terms of the proportionality factor  $A$  as a function of the potential field of particle). During exercise simplifying gave the advantage that you can track the movements and record the parameters (vibration frequency and the relative velocity) of a particle - this particle with mass equal to zero. Because the particle with a specific mass  $m$ , in which field was moving a test particle, remained motionless.

This simplification can be introduced by the existence of a physical law - **the law of equal vibration frequency**, which was discovered in October 2014. This law is as follows: **Two particles - centrally symmetric fields - with a total mass  $m$ , regardless of the proportion of their own masses  $m_1 / m_2$ , where  $m_1 + m_2 = m$ , with the same initial parameters of the interaction process, vibrate relative to each other with the same frequency.** \*6) Using the law of equal vibration frequency, the behaviour of two particles, one of which had a zero mass, and the other - mass  $m$ , can be moved to any pair of particles whose total mass is equal to  $m$ .

##### **4 a) Exercises – series 1**

In these exercises, was tested the vibration frequency of test particle in field of the other particle with mass  $m$ . In the potential shells of radius  $R=1$ , or 2, or 3 was also tested a top speed of the particle, which had during one half cycle of vibration. The results of exercises are presented in the Note 1.

### Note 1

Study of vibration frequency of a test particle  
on the c.s. field shell with radius R  
(const parameters: A1=1000, A2=0;  
parameter R is changing;  
made using comp. program AtomStand.exe)

R=1 l.u.      f=65,59958 Hz

R=2 l.u.      f=32,79979 Hz

R=3 l.u.      f=21,86653 Hz

The max. speed of the test body  
(at R=1 l.u., R=2 l.u., R=3 l.u.) - 46,48 s.u.  
(l.u. - length units; s.u. - speed units)

The results of this study show that, with three times bigger radius R of potential shell, the vibration frequency of the test particle on shell is three times smaller. The maximum potential in all three shells was the same - it was determined by the value of proportionality factor in potential function of "heavy" particle A1=1000 (this is the equivalent of the mass m).

The maximum speed of the test particle on shells was the same. Given that the shell of radius R=3 l.u. is three times "thicker" than the shell of radius R=1 l.u., test particle during each period of vibrations had to overcome three times longer route. Hence results three times smaller acceleration in the same potential field and three times lower frequency of vibration.

### 4 b) Exercises – series 2

In this exercise were tested how change the vibration frequency of the test particle when it is at the potential shell of its neighbors and the mass of the neighbor's particle is changing, that is, the factor A. In Note 2 are shown exemplary results of such study.

### Note 2

Study of vibration frequency of a test body  
on the c.s. field shells with radius R=3 l.u.

The value of A1 factor is changing

A1=3000    f=37,876 Hz    Vmax=80,45 s.u.

A1=6000    f=53,576 Hz    Vmax=113,81 s.u.

Relationship:  $53,576/37,876 \approx 2^{0.5}$   
 $113,81/80,45 \approx 2^{0.5}$

During the study, it was found that both the vibration frequency and maximum speed of the test particles, which are on potential shell of its neighbor, varies in direct proportion to the square root of times the mass change. For example, when the particle mass is increased four times, the vibration frequency of the test particle and its maximum speed are increased twice.

You can also compare the results recorded in the Note 1 and Note 2. On the potential shell of radius R=3 and the mass values of A1=1000 and A1=3000, the test particle vibrate with frequencies respectively of 21,867 and 37.876Hz. There is a relationship  $37.876/21.867=1.732$ . Similarly, in the case of maximum speed of the test particle:  $80.45/46.48=1,731$ .

### 4 c) Exercise 3

During exercise (series 1) was found that the vibration frequency of test particle on the potential shell varies inversely with the value of shell radius. So on the shell of radius R=3 vibration frequency is three

times lower than on the shell of radius  $R=1$ . This result shows that the maximum potential on the shell, in both cases is the same, but one shell is three times "thicker" than the other. For this reason as well, the acceleration is in one case three times smaller than in the second. This raises the question: To what value would have increased the potential of the "thicker" shell, in order to the vibration frequency of the test particle was as on the shell of radius  $R=1$ ? The study, which are recorded in the Note 3, show that the coefficient of proportionality function of the potential shell must be increased to nine.

### Note 3

Results at  $R=3$  l.u. And  $A1=9000$

$f=65,59528$  Hz  $V_{max}=139,43$  s.u.

Relationships between results and parameters:

$(9000/1000)^{0.5}=3$ ;  $139,43/46,48\approx 3$ ;

Then in fact, the frequency is approximately the same as on the shell of radius  $R=1$ , that is,  $f=65.6$ Hz, but the maximum speed of the test particle is increased three times, which increases in accordance with the results of which are shown in the Note 2.

### 5. Vibration energy of atoms

Currently in physics exist - long ago introduced - the concept of energy, on which "nobody knows anything." It is only certain that the energy "can not arise out of nowhere" and its transformation take place in accordance with the principle of conservation of energy. Presented here the physical **law of equal vibration frequency** indicates that energy is a relative term and current prevailing scientific views on energy are wrong. Because, in the first place, it is wrong notion that energy "can not arise out of nowhere." The source of this view are the works of Newton, in his research based on the tacit assumption that when the interaction between the constituents of matter varies with the distance changes, these changes always - in different structural situations - extend in the same way. This means that it can always be described by the same mathematical function, changing only the proportionality factor. Newton based his assumption on the findings of Galileo and Kepler.

The law of equal vibration frequency suggests that the concept of energy describes the physical parameter whose value varies and depends on the circumstances in which it arises. Suppose that we have two particles with a total mass  $m$  and the mass of each particle is  $m/2$ . Each of these molecule - in the initial state - is situated on the side of shell of its neighbor. In this initial point, and in the starting position, it has a speed equal to zero. One and the other shell accelerate the particles located on it and both particles vibrate, moving from one side of shell to the other. They perform the same vibrations, because they are the same particles - **they have the same mass and their potentials on the shells can be described by the same mathematical function.**

In this case, the vibration frequency and velocity of the particle relative to each other are the same as in the case where vibrations are performed by the particle with zero mass. But the energy of which is associated with the vibration of particles, in both cases is different.

At this point, you can pay attention to the relative nature of the concept of energy. The maximum speed of two particles of mass  $m/2$  relative to each other will be equal to  $v$ , and velocity of particles relative to the center of mass will be equal to  $v/2$ . The maximum kinetic energy of the two particles relative to the center of mass will be equal to

$$\text{to } E_{kc}=2*(m/2)*((v/2)^2)/2=(m*v^2)/8=0,125*m*v^2.$$

$$\text{At } m_1=0.5*m \text{ and } m_2=0.5*m \quad E_{kc}=0,125*m*v^2$$

Changing of the total energy - depending on the ratio of particle mass - is most noticeable when almost whole mass is concentrated in a single particle and the second particle has a very low mass. For

example  $m_1/m_2=n=1/9$ , and  $m_1+m_2=m$ . Then, the maximum particle velocity  $v_1$  and  $v_2$  relative to the center of mass will form in such a manner that  $v_1+v_2=v$ , and  $v_2/v_1=n=1/9$ . Thus, you can write:

$$E_{kc}=(m_1*v_1^2)/2+(m_2*v_2^2)/2=(m_1*v_1^2)/2+[(m_1/n)*(v_1*n)^2]/2=(m_1*v_1^2)*(1+n)/2$$

When  $m_1=0,1*m$ , to  $v_1=0,9*v$ , namely  $E_{kc}=(0,1*m*0,81*v^2)*(1+1/9)/2=0,045*m*v^2$ .

$$\text{At } m_1=0.1*m \text{ and } m_2=0.9*m \quad E_{kc}=0,045*m*v^2$$

It can be seen that there is a clear difference in the amount of energy for the first and for the second case. And it should be noted that in both cases the energy comes from the interaction of potential fields of two particles whose total mass is equal to  $m$ .

Presented here process of the particle vibration conducted in accordance with the law of equal vibration frequency, but in fact it runs under the laws of Galileo. Presented laws of equal vibration frequency as a separate physical entity (in the form of physical law) is intended to show the dependencies, which appears in special circumstances and is not easily to see. The law of equal vibration frequency is directly related to Galileo's law, which says that all particles in field of the other particle, irrespective of their masses, at the same distance move with the same acceleration. In other words, the acceleration on the potential shell depends only on the mass of the particle, which belongs to shell. Thus, a particle of mass  $m$  accelerates a test particle with a mass equal to zero, and during  $1/4$  period gives her the maximum speed  $v$ . The particle of mass  $m/2$  (having mass lower by half) gives the similar particle the half lower acceleration, and thus, gives it the half lower maximum speed  $v/2$ . But the second particle of mass  $m/2$  gives the particle at the same time, the same speed  $v/2$ , but in opposite direction. Therefore, the maximum relative velocity of particles is the sum of velocity and is the same as in the case of exercise with zero mass test particle, which is also the maximum relative velocity equal to  $v$ . Specifically, it is noticeable that the law of equal vibration frequency is enhanced description of Galileo in a different situation and a different point of view.

## 6. Energy of self-acceleration particle system

The relative changes in energy of the particle occur with interaction particle of matter which potential fields can be described by the same mathematical function. Even in this case reveals the fact that, the "energy comes from nowhere." Because in one case where the interacting particles are identical, the energy has a certain maximum value, in other cases, this value of energy can be almost zero. And this is despite the fact that total mass of particles, in one, and in the second case is equal to  $m$ . Even more clearly revealed the fact that "energy comes from nowhere " when two different particles interact with each other whose potentials on shells change (including changes in the distance) according to the two different functions.

The concept of "the same function" and "different functions" usually are related to the structural construction of function that is suitable to describe the distribution of potential fields - particles. But there are mathematical functions of such complexity that a change in the value of one of the coefficients - without changing the structure of the function - has the consequence that the same function, but with different coefficients, has to be categorized as "different functions". For this category should be included the individual components of PES functions that describe the distributions of potentials on shells with specific radius. In these ingredients, similar as in other functions that can be used to describe the distribution of potential fields, there is a coefficient of proportionality, which is equivalent to mass and affects only on the proportional change in the potential field, the field strength and speed, which particles obtain in this field. Changing the value of this factor does not lead to change in the structural nature of the functions. But individual components of PES functions still have the other factors.

Before we will say here about the other factors, should pay attention to some sort of agreement that

concern mathematical functions, but it has a relation with the laws of physics. Namely, it should be noted that the structural nature of the two mathematical functions are the same when two particles - which potential fields are described by these functions - interact with each other according to Newton's laws and the principle of conservation of energy. In contrast, the structural nature of two mathematical functions are different when described by using these features two particles interact with each other in contrary with the principle of conservation of energy and against the laws of Newton. The most distinctive feature of this second type of interaction is that in this case the common center of mass of the interacting particles cannot remain stationary (in this connection is meaningless concept of "common centroid"). Simply put, the interacting particles (as a system) automatically accelerate and achieve more and more speed. This behaviour is due to the fact that in this case there is no balance between accelerations (or speed) given by the particle to each other and their masses. In other words, the speed that the particles reach as a result of mutual acceleration, are not proportional to the masses of particles, which are the cause of the existence of these speeds.

Ingredients of PES function that describe the shells of different radii, besides the proportionality coefficient have a number of the other factors (or parameters) which may change. Precisely, the size change of the other factors (parameters) at the same time changing the nature of the function. One of these parameters is the radius of shell. When using the potential shells, two particles interact with each other which all other parameters have the same, but slightly different in size of its radius, than each of the particles – placed on the potential shell of its neighbor - move with different acceleration. This is the cause of self-acceleration of the two particles and achievement through the system more and more speed. In this way, the system achieves an increasing kinetic energy, which may be said that "comes from nowhere." One example of such structural nature of two different types of particles, which system automatically accelerates, is the particle "alpha".

In the structures of atomic nucleus of elements with high atomic mass is a plurality of "alpha" particles. But in these structures particles "alpha", by accelerating in the opposite direction, suppress the self-accelerating tendency of its neighbors. This happens to time, until there is a stable state of the nucleus. When there is a disturbance of the equilibrium stable of atomic nucleus, which happens mainly in the atoms of radioactive elements, then the particles 'alpha' stop reset your acceleration and with high acceleration fly out of the nucleus as the "alpha" radiation. This is how it looks the radioactive decay of an atom.

Such disintegration can happen even in the case of non-radioactive atom of the element. But there must be a reason that disturb the equilibrium structure of atom and lead to its disintegration. And the cause may be, for example, collision of the high speed particle "alpha" with atomic nucleus.

While discussing here the existence of many factors in the components of PES function should be borne in mind that this is another "happy coincidence". Because changing coefficients in the component of PES function, you can change the nature of mathematical functions. It is a way to adapt this function so as to how best to describe the potential shells and reflectivity of the properties of neutrons, protons and protoelectrons that (those properties) will be discovered in the future as the course of practical studies of these particles.

## **7. Intermolecular and chemical bonds**

Currently in science there is a view that the chemical bond is any fixed combination of two atoms. It is said that the bonding occurs as a result of electron hopping between atoms. Here we deal with specific causes of the bonds between atoms, which under different circumstances are formed in different ways. All these bondings are similar in the sense that they all come through molecular potential shells. But, in different circumstances, interatomic bonds are formed through the shell, which have different radii.

### **7 a) Shells filling by protoelectrons**

Stories about the fact that the interatomic bondings are created by electrons should be a fairy tale. Because there are particles that can be called electrons, but their participation in the formation of bonds

between atoms is very modest. Considering the participation of electrons in the atoms bond with each other, you may even find that in certain circumstances they are an obstacle in the formation of these bonds. But about that will be a bit further.

Nuclear shells are the most important elements that determine the course of the process of atoms formation. In this process, continuous also has its share the clouds of protoelectrons which surround protons and neutrons from all sides, and more particularly, surround their central points. This surrounding of central points of protons and neutrons by protoelectrons, as well as increasing density of protoelectrons towards to the center of protons and neutrons are relative concepts. Because these parameters are difficult to determine unambiguously. However, it is certain that such densification of protoelectrons takes place. It is logically associated with a compaction matter processes that take place on the macro and on a cosmic scale. Because the processes occurring in the macro and large scale originate from the parameters of protons and neutrons and their ability to concentrate the particles of matter, which already exists at the most elementary level and close to the center of particles.

The process of concentrate protoelectrons, proceeds in accordance to the gravitational component of fundamental interactions of protons and neutrons. In space there is no shortage of protoelectrons, because they are constituents of matter, which formerly was called ether, and now is called the matter of physical vacuum. If in the function of potential distribution of protons and neutrons there was no structural component that describes the potential shells and anti-shells, in the protons and neutrons, with the change of distance of the central points, the density of protoelectrons would change smoothly. Existence of potential shells and anti-shells is the cause of that the density of protoelectrons is variable. The agglomeration of protoelectrons in protons and neutrons is cut on spherical layer by shells and anti-shells. These layers are placed in the areas of shells and anti-shells, and concentrically surround the centers of protons and neutrons. In areas of potential shells - where the potential is greatest - there is an increased density of protoelectrons. This increase of density takes place at the expense of increased dilute of protoelectrons near the sides of potential shells. Because the particles - lie in places of potential-sides action - are accelerated towards to the place where is the greatest potential of the field.

In areas of anti-shells there is a dilute medium of protoelectrons, because in there the particles are accelerated in such directions that they move away from the place of extreme potential of anti-shells.

### **7 b) Structural effects of filling proton and neutron shells by protoelectrons**

Tight filling by protoelectrons of the areas around the central points of protons and neutrons, and their concentration in the areas of potential shells entails certain consequences. This state of high density is reflected in the physical phenomena that are associated with the formation of material structures.

In the first place it has its consequences in terms of the conditions that are necessary for the formation of atomic nucleus, namely, they must be a special conditions. Such conditions occur in nature only in the interior of stars. There exists a sufficiently high density of protons and neutrons, which allows the particles get closer to each other at a distance so small that their central points were in the area of nuclear potential shells of neighboring particles. Only then these particles can connect with each other and create an atomic nucleus.

The creation of nucleus, which is made up of a certain number of nucleons, is equivalent to the fact that the potential field of nucleons overlap and add to each other. In this way they create a resultant potential field of the atomic nucleus. This situation means that the ability to densification of protoelectrons by gravitational component of the field of atomic nucleus is much larger than the similar ability of a single nucleon field. This ability to compaction is about as many times higher as the number of nucleons that contain in the nucleus.

This situation is reflected in the different density of protoelectrons that exists in the areas of molecular shells of atoms of different elements. Chapter 2 of this study shows that the molecular potential shells

of different atoms are similar to each other in terms of the size of radius. But on that the similarity ends. Because the same shell of different atoms having the same radius values, have in their areas the different maximum potentials and therefore have different density of protoelectrons. The result of this is that some of atoms can be easily combined with each other and form a bond by shells with a relatively small radius. In contrast, a much heavier atoms on the similar shell (with the same size of the radius) are so strongly compacted by protoelectrons that virtually can not create any bonds.

The result of this state of affairs is that **the molecules, which include atoms with lower atomic mass, have generally smaller length of the bonds than molecules include atoms with higher atomic mass.** Examples of these relationships are presented in the Note 4.

#### Note 4

	Molecule	Bond length	Atomic mass	
a)	H <sub>2</sub>	74,14	H – 1,01	
b)	HI	160,9 pm	I – 126,9	
	HBr	141,4 pm	Br – 79,91	
	HCl	127,4 pm	Cl – 35,42	
	HF	91,7 pm	F – 19,0	
c)	H <sub>2</sub> S	133,6 pm	S – 32,06	
	H <sub>2</sub> O	95,84 pm	O - 16	
	CO	112,8 pm	C – 12,01	
	CH <sub>4</sub>	108,7 pm		
	C <sub>2</sub> H <sub>2</sub>	C-C		120,3 pm
		C-H		106,0 pm

The smallest bond length has the molecule H<sub>2</sub> - it amounts to 74.14 pm. The atoms that are many times heavier than hydrogen, when combine with a hydrogen atom, form a bond with a greater length. This is visible in groups a) and b), which are shown in the Note 4. The group c) is separated here to show that the affect on the bond length have the parameters of both atoms that form the bond. The carbon (C) and hydrogen (H) form a bonds at lengths 106.0 pm and 108.7 pm, and the two carbon atoms form a bond 120.3 pm. This is because the density of protoelectrons that accompany atoms, during the formation of the bond, partially penetrate each other and somehow superimpose on each other. When such interpenetration is becoming increasingly difficult, then this process is a factor that slows the approach of the atoms to each other. Accordingly, such inhibitory effect is greater between two carbon atoms (C), rather than between the C atom and the H atom.

The process of bonding between atoms depends on the conditions. It may happen that due to an event (or collision), one atom will lose part of their concentrated cloud of protoelectrons (in this case can be said to have lost an electron). Then this event promotes the creation of bonds with another atom, which together with its cloud of protoelectrons somehow falls into the gap. Difficulties in the formation of interatomic bonds that arise due to concentrated matter of protoelectrons around the atoms, are very complex. This is visible in the case of carbon atoms (C). In acetylene molecule (C<sub>2</sub>H<sub>2</sub>) the distance between carbon atoms is 120.3 pm. But the distance between carbon atoms in the hardest mineral - diamond – is 154 pm. Here, each atom is surrounded by four neighbors, located at the vertices of the tetrahedron. So, in diamond there is so large compression of protoelectrons that it prevents the formation of bonds with shorter length, for example, such as acetylene.

## 7 c) Protoelectrone compactions and properties of matter

By the way, you can recall the conditions, that once prevailed where today there are deposits of diamonds. To the formation of diamond structure in natural conditions long time ago, contributed the high temperature and high pressure. So diamonds formed under conditions which, although they were much rows milder, they were similar to those in which they were created and currently create inside stars, consisting of a number of nucleons, the atomic nucleus.

Taking into account the parameters of structure, the effect of protoelectron density can also be seen in the structure of graphite. Here, the smallest distance between the C atoms is 142 pm, which is smaller than in diamond. But in the structure of graphite, in a single layer, the atoms form a hexagonal cells, in which each atom is surrounded by the three nearest atoms, not four like in diamond. The distance between layers is 335 pm. That is, the lower number of carbon atoms (C), placed in the nearest distances to each other, less contributes to compaction of protoelectrons. This results in that the bond length between the nearest atoms is smaller than in the diamond.

With the graphite and diamond structures are correlate a physical parameters such as thermal conductivity and electrical conductivity. Where there are areas of more rarefied medium of protoelectrons, the free electrons can move more freely. Just for this reason the graphite in parallel directions to the structural layers has a higher electrical conductivity than in perpendicular direction to layers. Because for a good electrical conductivity must be fulfilled two related conditions:

1. the structure must be able to release free electrons
2. it must not be too concentrated medium of protoelectrons

In graphite, both of these conditions are met, and in the diamond – no.

Diamond is dielectric. Because in this structure, there is no appropriate routes for the flow of free electrons. But diamond has a very high thermal conductivity. It is several times higher than metals. For a good thermal conductivity of diamond affect the same structural parameters that affect of its very high hardness. This is due to high rigidity and durability of interatomic bonds and high density of protoelectron medium in areas between atoms. In this medium the thermal waves are moving in a similar manner as the sound waves are moving in a gaseous medium. In a similar way in diamond the light waves are spreading. In this respect, the diamond medium of protoelectrons is also similar to the gaseous medium. Because in gaseous medium the sound waves propagate in the range of very low frequencies (very low tones) to very high frequencies (very high tones).

## 8. Energy levels of atoms

What means that the potential shell acts as an energy level? When the outsider atom is located on the potential shell, the energy level of this shell is determined by the maximum energy, which may have the outsider atom and remains in the area of shell. As long as the velocity of atom on the shell does not exceed a certain maximum value this atom will vibrate in the area of shell without leaving its. Only when, as a result of additional acceleration from outside by pulses resonance energy or by the act of one strong stimulus, energy of atom exceeds the energy level of shell, then atom leaves the shell.

Energy levels of atom are directly related to its potential shells. But there are also indirect dependency from potential shells. Because the energy levels of atom are also dependent on degree of filling by protoelectrons the area in which is the atom, and particularly, to fill those places that occupy a molecular shells. The shells play (for atoms) a role of energy levels as long as they are not too filled by protoelectrons. Too high density of protoelectrons on the potential shell contributes to the fact that outsiders atoms can not overcome the resistance, which create concentrated medium of protoelectrons, and can not create with neighboring atoms the molecular bonds.

The shell filled by protoelectrons ceases actively participate in the creation of interatomic bonds, and thus also cease to be active energy levels for outsiders atoms. In this case, the atoms may be linked to

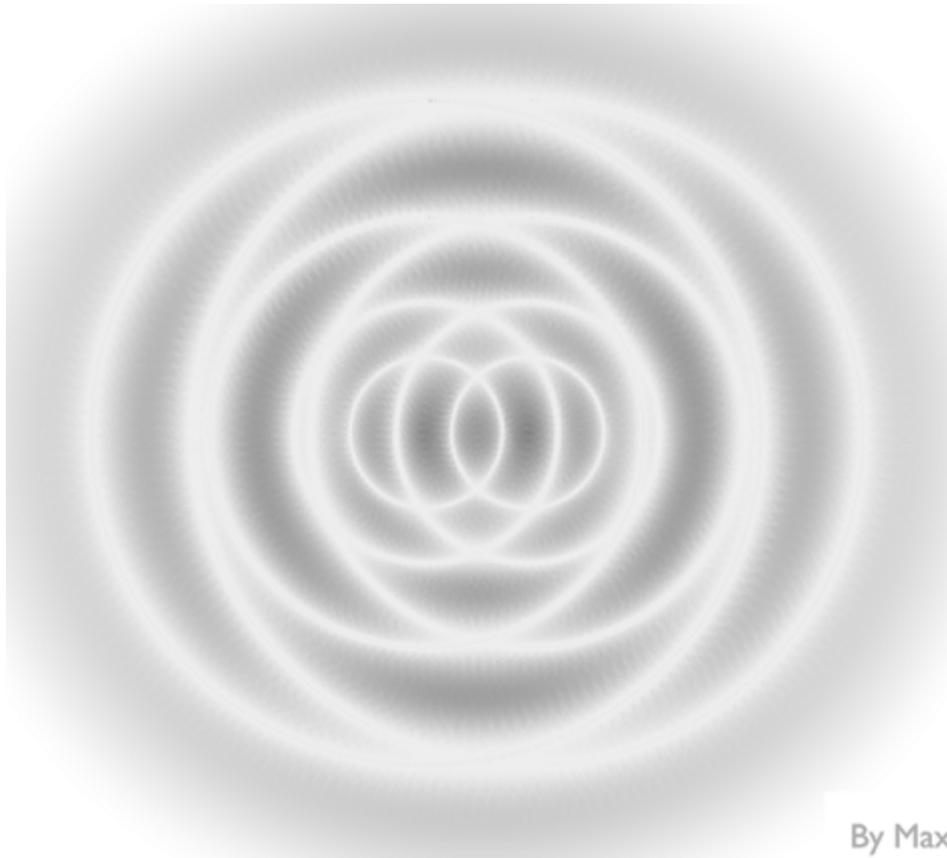
each other by potential shells which have larger radii. Protoelectron density on these shells is lower and there is an obstacle in the formation of interatomic bonds.

The energy levels of atoms are twofold. This duality of energy levels results from different relationship with respect to atoms and protoelectron segments. Potential shell of the atom, which is so strong filled by protoelectrons that ceases to act as active energy level for outsiders atoms, does not cease to act as the energy level for medium of protoelectrons located on the shell.

From the point view of a physical law of equal vibration frequency and with the effects that are associated with it, results that the energy level of the shell is a relative term. It is the size of binding energy between two atoms, which was created with the participation of shell. This size depends on the total mass of atoms and proportion between the mass values of those atoms. As already known, when the total mass of the two atoms is  $m$ , the maximum binding energy created by the potential shell will exist only if it will be two atoms with the same mass.

The binding energy of atoms, created by the shell and binding energy of protoelectron agglomeration on this shell, have two different energy values. The concept of "binding energy of protoelectron agglomeration on the shell", is also ambiguous. Because there is no repetitive physical being, which in each case is the same "agglomeration of protoelectrons". Although, currently in physics there is such repeatable being, called and described as an electron. But these stories about the electron should be a fairy tale. The protoelectron agglomeration can be called electron. But keep in mind that the electrons are different. They are created as separate agglomeration of protoelectrons and this is a by-product of the formation of interatomic bonds. This product is produced during the formation of bonds between atoms, because then their potential shells intersect each other. By the way they also intersect agglomeration of protoelectrons and create segments with them - electrons having different shapes, dimensions and total mass.

The outline of the formation of different electrons is shown below in the example of connect the two quasi-atoms (- "quasi" is added here to emphasize the fact that we are dealing with an approximate description of atoms).



In the figure are shown the potential shells in the form of dark areas. They are limited, "from the outside" and "inside" by the anti-shells (bright areas). These two quasi-atoms form a bond with each other by means of shell with the smallest radius. The drawing shows that the areas of shells with compacted protoelectrons are divided into segments – these are quasi-electrons. The segments of concentrated protoelectrons have a different dimensions and different shapes.

When as a result of interactions between various atoms and molecules reaches to detach the segment, the first is detached one of the outer segments. But during such processes may occur different situations. Thus, it may happen that along with the outer segments, will be also detached the segments that are closer to the center of atoms.

The atoms that are on the shells of its neighbors, vibrate with certain frequencies. The vibration frequency of atoms depends on their parameters and positions relative to each other. When the atom vibrates on the shell of its neighbor, it vibrates everything that is sufficiently tightly related. That is, together with atom, trapped on the the shell segments with concentrated protoelectrons also vibrate. But the atomic vibrations and vibrations of the segments are held at various frequencies. Atom by using the potential shells enforces the movement on the segments in his average rhythm. But the segments are mounted on shells in an elastic manner. Thus, except the vibration of atom as a whole, there are an individual vibrations of segments. Each of them vibrates at suitable frequency. Thus, the vibration, which propagate in space through the medium of protoelectrons, have a very complex character.

## 9. End

Author does not have the ability to independently investigate the spectral lines of atoms of various chemical elements and the length of bonds between atoms in different molecules. For this reason, there is also no possibility to create a base for develop an atlas of shells and anti-shells. Such database currently exists, but it exists in fragmented form. Its ingredients are known to those skilled in the narrow field of science. Some specialists deal with spectral lines, other specialists deal with interatomic bond lengths. But nobody of those specialists do not relate their knowledge with the radii of shells and anti-shells or segments of concentrated protoelectrons.

It is hoped that in the future there will appear people who will newly look at construction of atoms and will have appropriate knowledge. Based on knowledge, they are able to create an atlas of shells and anti-shells of all atoms existing in the nature. They can also choose the appropriate parameters for the function of potential fields, which can determine the energy levels for specific atomic bonds. Then indeed today's knowledge (or rather, "knowledge") about electrons and their role in the creation of interatomic bonds will be a fairy tale.

It's all a matter of the future. Before this happens, in the minds of many people should appear **changes of the atoms work**. The present article and other Pinopa's articles should help in this matter.

## 10. Annotations

\*1) Examples of simple descriptions of physical phenomena can be found in a series of articles, "Oh, it's very easy!"

\*2) About the fundamentals construction of matter by KTP can be read in the papers:

"The essence of fundamental particles of matter and impacts" on

[http://nasa\\_ktp.republika.pl/Protoelektron.html](http://nasa_ktp.republika.pl/Protoelektron.html) and "Hydrogen atom - what is most important," at [http://nasa\\_ktp.republika.pl/Atom\\_wodoru.html](http://nasa_ktp.republika.pl/Atom_wodoru.html).

\*3) The experimental facts, in form of changes in velocity of space probes Pioneer 10 and Pioneer 11 during its motion in the gravitational field of the Sun, suggest that the fundamental fields of protons and neutrons can also contain a shells with very large radii. Summed potentials of the shells of all the particles that make up matter of the Sun, resulting in a huge change of size in the potential field around the Sun. This proves, therefore, the existence of at least one potential shell with dimensions of the shell radius in cosmic scale.

- \*4) The inner side of potential shell is the area of various potential fields of shell which are closer to the center of particle, rather than the maximum potential of the shell. However the outer side is located further away from the center of particle, rather than the distance to the maximum potential of the shell.
- \*5)The particle "alpha" is the nucleus of helium isotope  $4\text{He}$  - the least active chemical element that has a very high ionization energy. Ionization energy should be understood here as an energy that has to be supplied to an atom to remove an existing part of the high-density cloud, which consists of protoelectrons. This removed part of protoelectron cloud is identified with the electron that has been deleted or moved to a higher energy level.
- \*6) The working of physical law of equal vibration frequency can be traced using the computer program AtomStand.exe and files(.ato format), which store the results of exercises. The program and files can be copied from <http://pinopapliki1.republika.pl/AtomStand.zip> and [http://nasa\\_ktp.republika.pl/Czestotliwosc\\_drgan.ato.zip](http://nasa_ktp.republika.pl/Czestotliwosc_drgan.ato.zip).

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Poland, Legnica, 2015.02.17.