FOURTH SPATIAL DIMENSION

Korotkov V.E. (Russian Federation) Email: Korotkov455@scientifictext.ru

*Korotkov Vladimir Ermakovich - independent Researcher,
CHERNOGOLOVKA*

Abstract: *the article says that the appearance of an electron and a positron in the collision of gamma quanta is explained by the sufficient energy of photons for the appearance of the fourth spatial dimension. Elementary particles are four-dimensional formations. What people called the charge of elementary particles is the fourth spatial component, and for its appearance one needs to expend energy. The fourth component makes the electron and proton stable particles. Unstable elementary particles are excited states of the fourth dimension, and their decay is relaxation to a stable state. During relaxation, intermediate short-lived states are possible, which are also called elementary particles. The annihilation of elementary particles is the elimination of the fourth dimension and energy is released. The charge of elementary particles is determined by the size of the fourth dimension, and this size is the same for an electron, a proton and all excited states, therefore it cannot be fractional to the charge of an electron. The internal structure of a proton exists, but this does not mean that quarks exist. The fourth spatial dimension allows us to understand the structure, neutrinos and antineutrinos, and also to explain the non-symmetry of matter and antimatter. The Big Bang is the transition of a multidimensional proto-substance to a state with a lower dimension. Remnants of the four-dimensional proto-substance are present in the Universe even now. Voids are formed around them. These remnants of proto-substance, which are called dark energy, are also responsible for the expansion of the Universe. The interaction of the flow of vacuum with elementary particles leads to what is called dark matter.*
Keywords: *electric charge of an elementary particle, annihilation, neutrino, antineutrino, dark energy, dark matter.*

ЧЕТВЁРТОЕ ПРОСТРАНСТВЕННОЕ ИЗМЕРЕНИЕ

Коротков В.Е. (Российская Федерация)

*Коротков Владимир Ермакович – независимый исследователь,
г. Черноголовка*

Аннотация: *в статье говорится о том, что появление электрона и позитрона, при столкновении гамма-квантов, объясняется достаточной энергией фотонов для появления четвертого пространственного измерения. Элементарные частицы - это четырёхмерные образования. То, что люди назвали зарядом элементарных частиц, есть четвёртая пространственная составляющая, и для её появления надо затратить энергию. Четвёртая составляющая делает электрон и протон стабильными частицами. Нестабильные элементарные частицы, это возбуждённые состояния четвёртого измерения и их распад - это релаксация до стабильного состояния. При релаксации возможны промежуточные короткоживущие состояния, которые тоже назвали элементарными частицами. Аннигиляция элементарных частиц - это ликвидация четвёртого измерения, и при этом энергия выделяется. Заряд элементарных частиц определяется размером четвёртого измерения и этот размер одинаков для электрона, протона и всех возбуждённых состояний, поэтому он не может быть дробным к заряду электрона. Внутренняя структура протона существует, но это не значит, что существуют кварки. Четвёртое пространственное измерение позволяет понять структуру нейтрино и антинейтрино, а также объяснить несимметрию материи и антиматерии. Большой взрыв - это переход многомерного протовещества в состояние с меньшей размерностью. Остатки четырехмерного протовещества присутствуют во Вселенной и сейчас. Вокруг них образуются войды. Эти остатки протовещества, которые назвали тёмной энергией, ответственны и за расширение Вселенной. Взаимодействие потока вакуума с элементарными частицами приводит к тому, что называется тёмной материей.*
Ключевые слова: *электрический заряд элементарной частицы, аннигиляция, нейтрино, антинейтрино, темная энергия, тёмная материя.*

NATURE OF ELECTRIC CHARGE, ANNIGILATION.

The Big Bang, that gave rise to our Universe, created a vacuum and the three-dimensional space that we are used to. The vacuum consists of quanta of space. Photons, three-dimensional formations, created from them. Photons of high energies are called gamma-quanta, they are also three-dimensional formations. If a sufficient amount of energy is applied to a point in three-dimensional space, then there will be an increase in the dimensionality of space, at this particular point in three-dimensional space. A fourth spatial dimension will appear. Further, we'll call it a breakdown into the fourth dimension. This breakdown is symmetrical along the minus axis, and along the plus axis, of the fourth spatial coordinate. The magnitude of this breakdown q is the same in these two directions. The fourth spatial dimension is self-enclosed, its size is small, quantum. It is possible to achieve sufficient energy for breakdown having pushed two gamma - quantum, with necessary energy. We cannot imagine the fourth spatial dimension in our minds, but we can imagine a sphere. Let this be our three-dimensional space, which is also closed on itself. In Fig. 1, at the point of breakdown, a four-dimensional object is depicted, with a breakdown depth q, along the fourth coordinate.

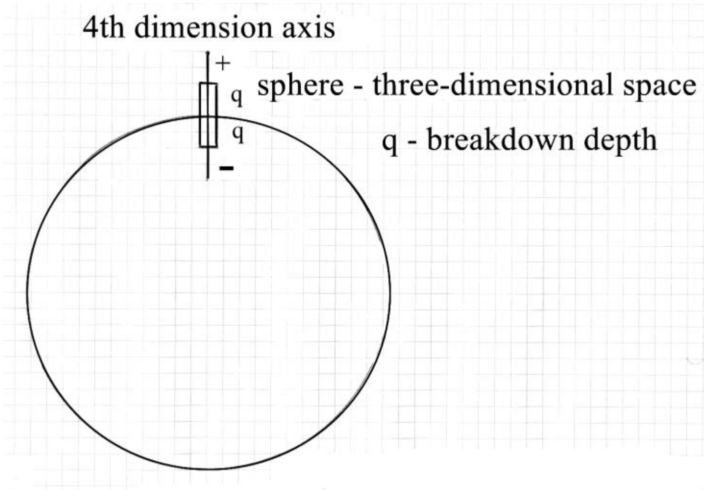

Fig. 1. Four-dimensional object

Now the curvature of three-dimensional space is small, so let's imagine it as a plane. And the axis of the fourth dimension goes perpendicularly. On one side plus (+), on the other minus (-). If the formation of a four-dimensional object, at a specific point in three-dimensional space, occurs in a strong electric field of the nucleus of an atom, then this formation will be divided into two different four-dimensional objects. This is shown schematically in Fig. 2.

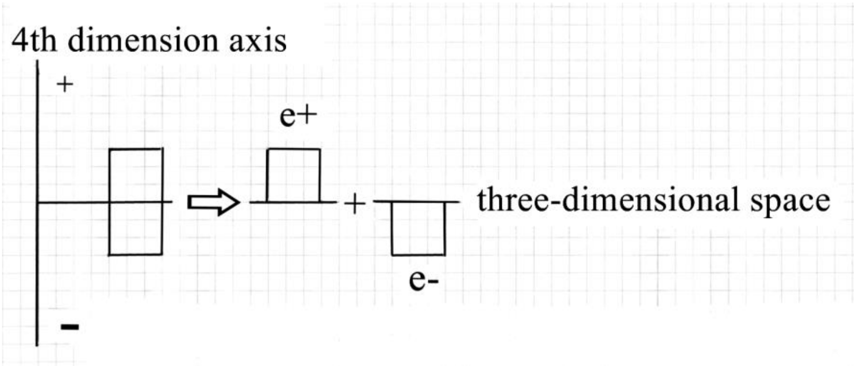

Fig. 2. Breakdown division in an electric field

Having a fourth dimension makes these objects stable. The fourth dimension itself cannot disappear. After division, in an electric field, we obtain an electron (e-) and a positron (e +). The physical essence of the charge of an elementary particle, is the fourth spatial dimension, for the appearance of which it is necessary to expend energy. The magnitude of the charge, in absolute terms, of the electron and positron is determined by the depth of the fourth dimension q. The depth is the same, the charges are the same in module. And the breakdown structure of the electron and the positron is the same, so annihilation can occur, when at the fusion of the electron and positron both breakdowns in the fourth dimension will destroy each other, and photons disperse in the three-dimensional space. Annihilation, is the disappearance of breakdowns in the fourth dimension, the disappearance of the fourth dimension of elementary particles, after which they cease to be particles. If energy is needed for the appearance of the fourth spatial dimension, energy is released during annihilation.

INTRODUCTION OF THE CONCEPTS OF DROP AND SEMI DROP,
PROTON, ANTIPROTON,
ASYMMETRY OF MATTER AND ANTIMATTER,
UNSTABLE ELEMENTARY PARTICLES.

And what will happen if many quanta of space are uploaded into the fourth spatial dimension? We get the excited state of the fourth dimension. If a breakdown has already occurred, but there is no division into plus and minus yet, we have what we call a drop. After the division, we have semi drops. The drop lifetime is usually shorter than the semi drop lifetime. So, a drop is an excited state in which a breakdown along the axis of the fourth dimension is both in a plus and a minus. A semi drop, this is an excited state of breakdown in the fourth dimension, either in plus or minus. Let us return to the model when the plane is three-dimensional space, and the fourth spatial dimension is perpendicular to this plane. In relation to the three-dimensional space, in the fourth dimension, the rotation of a wave of quanta of space inside a semi drop can be either clockwise or counterclockwise. And we, observers, are always in the three-dimensional dimension, so the direction of rotation does not depend on how we look at it from three-dimensional space. Spin is the rotation of a wave of quanta of space in the fourth dimension of an elementary particle. This rotation, in semi drop, is denoted by a value 1/2. Talking about of the spin of a drop, in itself, is impossible. This is an object within which processes of breaking through three-dimensional space into the fourth dimension, or annihilation processes, are possible. What kind of the rotation, it is not clear. The spin of the drop is determined based on the spins of the particles that result from the decay of the drop. In Fig. 3, schematically, a drop and semi drops are shown.

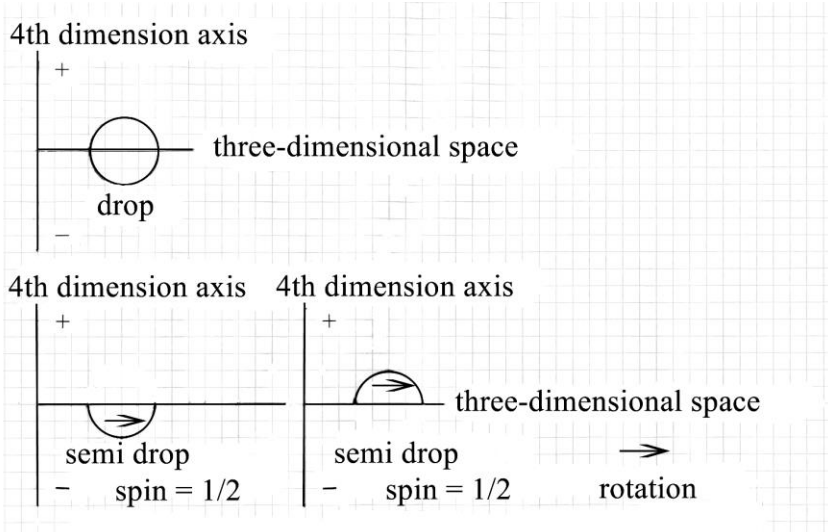

Fig. 3. Drop and semi drops

Breakdowns in the fourth dimension can be of the first and second kind. A breakdown of the first kind, this is a breakdown in the hair (a one-dimensional object). A breakdown of the second kind is a breakdown in a sphere (a two-dimensional object). The electron and positron have a breakdown of the first kind, and the proton (p +) and the antiproton (p-) have a breakdown of the second kind. The mass of an elementary particle is determined by the number of quanta of space loaded into the fourth dimension of the particle. A proton is a stable state, in mass, of a breakdown into the fourth dimension, from three-dimensional space, with breakdown in a sphere around the three-dimensional center of a proton. The proton charge is determined by the depth of the fourth spatial dimension q, like a positron. They have the same charges. Proton mass is determined by the depth of the breakdown q and the shape of the breakdown of the second kind. And for an antiproton, a breakdown of the second kind is directed in the same direction as for an electron. To get a breakdown of the second kind, in the fourth dimension, you need to concentrate a large amount of energy at one point, for example, by hitting a proton in the nucleus of an atom. Then, in addition to the initial proton and atomic nucleus, a proton and an antiproton will be born. Due to the different types of breakdowns, in the fourth dimension, there can be no annihilation of the proton and electron, but there can be their joint compounds. Now the curvature of three-dimensional space, in an ordinary vacuum, is such that the breakdowns are symmetrical along the axis of the fourth dimension. But, in the very first moment of the formation of our Universe, after the Big Bang, the curvature of three-dimensional space is very large. This is shown schematically in Fig. 4.

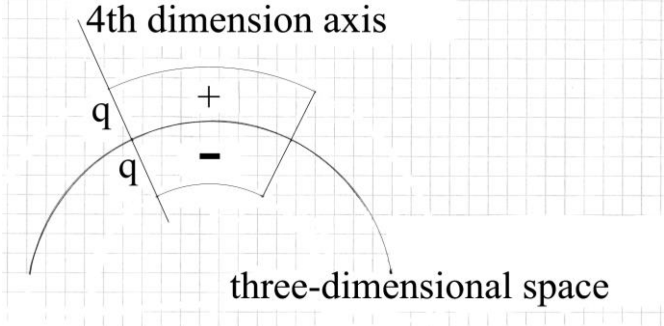

Fig. 4. Asymmetric breakdown in the fourth dimension

Such a large curvature leads to the fact that in the plus direction of the fourth dimension, there is a breakdown of the second kind, and in the direction minus a breakdown of the first kind. The depth q of these breakdowns is the same, but the quantity of quanta of space loaded into the plus region, and into the minus region, will be different. When dividing such a drop, semi drops appear with different kinds of breakdowns. There is no symmetry. One such semi drop gives an electron after relaxation, and the other proton. But, it can be, only in the minimum period of time from the moment of the Big Bang. As soon as, with the expansion of our Universe, the curvature of three-dimensional space, decreasing, reached a certain value, the breakdowns in the drops became symmetric in mass. If one assumes the formation of another Universe, then after the moment of another Big Bang, the process of asymmetry of the minus and plus would necessarily be repeated, and the other Universe would also be from electrons and protons. So there would always be matter. But it's not known what the depth q of the fourth dimension will be. In this other Universe, the charge of the electron and proton, in absolute terms, could be another. And due to the fact that the masses of the proton and electron depend on the magnitude of their electric charge and the type of breakdown, then they could be another. There may be another Periodic table. Similarly, like an electron, a proton has a wave rotation, in the fourth dimension, either clockwise or counterclockwise. The proton spin is 1/2. Artificially we uploaded into the fourth dimension more quanta of space than that which corresponds to the steady state of breakages. After the injection of extra quanta of space, transitions from a more excited state of breakdown to a less excited state will begin. Transition through intermediate states is possible. If we can fix the time of their existence, then we call such "steps", drops or semi drops, as unstable elementary particles. Intermediate states will have different lifetimes, different masses, but the breakdown value q, in the fourth dimension, will always be the same. Therefore, their charge will always be, modulo, like an electron. Or zero. No fractional charges, relative to the charge of an electron, will not. The whole theory of the decay of elementary particles, is the relaxation of the excited state of a drop or semi drop, through a series of other less excited states, to stable, by mass, breakdown states in the fourth dimension. For the first kind, this is the mass of the electron, for the second kind, this is the mass of the proton. Decay options, with their "steps", may be several.

NEUTRON.

Neutron (n), is a combination of an electron and a proton. In a neutron, a one-dimensional breakdown of an electron in the fourth dimension rotates in the form of a wave along a two-dimensional breakdown surface into the fourth dimension of a proton. It must be borne in mind that in this case, in a neutron, breakdowns from an electron and a proton interact with each other, but do not enter one into another. It turns out the imposition of two stable, by mass, breakdowns in the fourth spatial dimension. In Fig. 5, schematically, a connection is shown, a neutron, in which the breakdowns are combined.

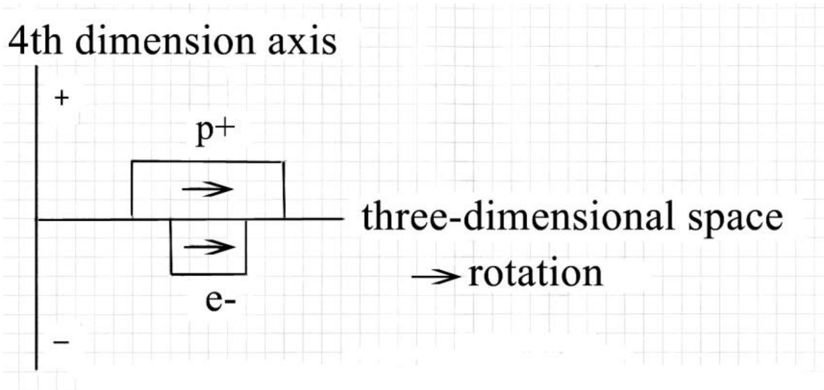

Fig. 5. Neutron

The rotation in the fourth dimension of the neutron is directed in one direction. The neutron spin is 1/2. It is possible to make a drop from a neutron by transferring it to an excited state. In 1970, at the electron accelerator built at Stanford (USA), the distribution of electric charge in the proton and neutron was obtained. In Fig. 26 shows the charge distribution, plus and minus, depending on the center of the proton and neutron [1, p. 206].

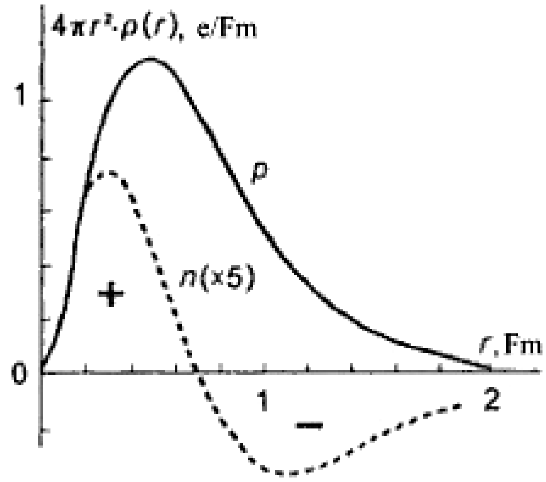

Fig. 6. The distribution of electric charge in the proton and neutron

The angular distribution of ultra-high energy electrons showed that the proton has an internal structure. It was assumed, that there are smaller formations inside the proton. In our article, inside the proton there is a breakdown of the second kind inward the fourth dimension, in the sphere around the center of the proton. This means that there is a inner region inside the sphere, the breakdown sphere itself and the outer shell. As it were, three constituent parts, inside the proton, which cannot be separated from each other.

NEUTRINO AND ANTINEUTRINO.

Now let's combine two breakdowns of depth q, one from the electron, the other from the proton. That is, a breakdown of the first kind, without filling it with a sufficient number of quanta of space so that it becomes an electron, with a breakdown of the second kind, also without filling it with a sufficient number of quanta of space, like a proton. Filling with quanta of the space of the fourth dimension of both is, but it is minimal. For a stable state of such an formation, breakdowns must be connected relative to each other in the fourth dimension by rotation in one direction. And let such a connection exist. If the breakdown of the first kind in the region is minus, and the breakdown of the second kind in the region of plus, in the fourth dimension, then let it be an antineutrino. And if, on the minus side, a breakdown of the second kind, like an antiproton, and on the plus side, a breakdown of the first kind, like a positron, then this is a neutrino. So, antineutrinos and neutrinos, are types of stable formations when there are two different breakdowns in one compound. In one direction, along the axis of the fourth dimension, a breakdown of the first kind, in the other direction, a second kind. It looks like a sewing needle, a needle with an ear. Needle, this is a breakdown of the first kind. Ear, this is a breakdown of the second kind. Fig. 7, schematically, shows an antineutrino and a neutrino. Where the needle is minus and the ear is plus, it's an antineutrino. If the needle is in plus and the ear is in minus, it's a neutrino.

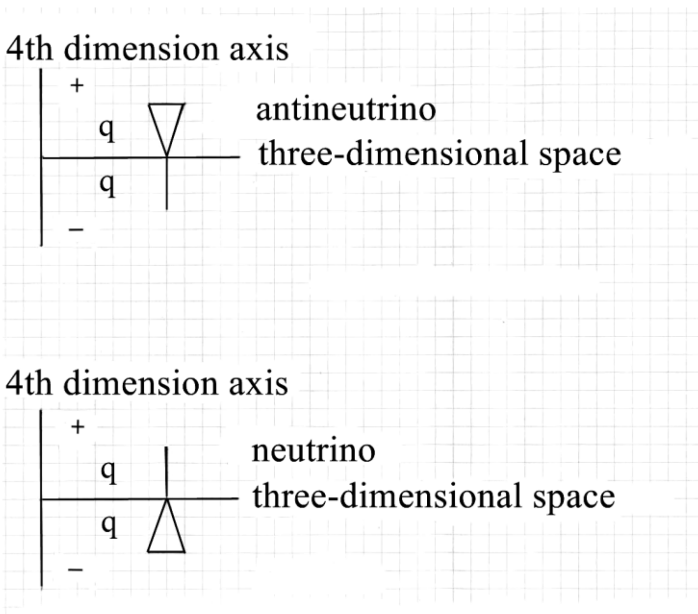

Fig. 7. Neutrino and antineutrino

The waves of the quanta of space that are inside the breakdowns rotate in one direction. Therefore, neutrinos and antineutrinos have the concept of spin equal to 1/2. Let's go back to the neutron. In Fig. 8 it added the combination of breakdowns of the first and second kind.

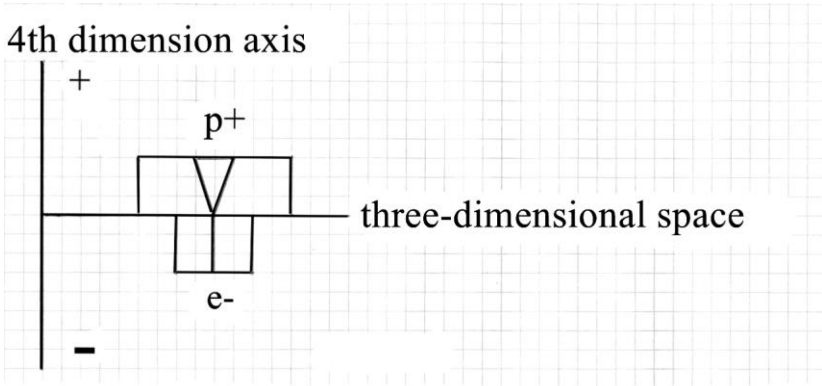

Fig. 8. Neutron with breakdowns of the first and second kind

Inside the neutron, the connection of two breakdowns in the fourth dimension, the one that will become an antineutrino at neutron decay. To carry out the neutron decay reaction, the neutron must go into an excited state. Therefore, in Fig. 9 we added the object Z, which, when interacting with the neutron, gives excitation to the neutron and forms a drop.

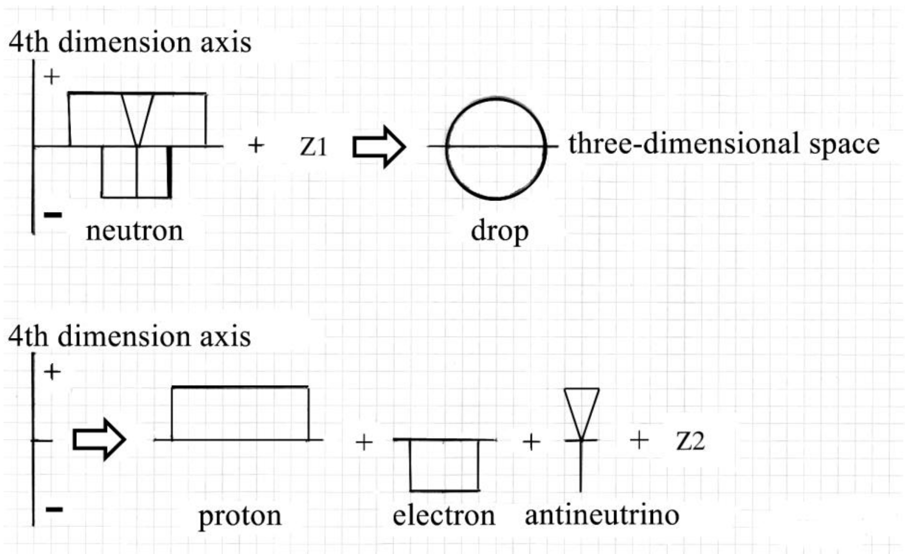

Fig. 9. Neutron decay

Then this drop drop is divided. Object Z, before the collision, is in state Z1, and after the reaction in state Z2. Object Z can be an elementary particle, a photon, a neutrino or an antineutrino. Let us consider the interaction of a neutron with a neutrino or antineutrino. In Fig. 10 shows its interaction with neutrinos, with the formation of a proton and an electron. It is allowed.

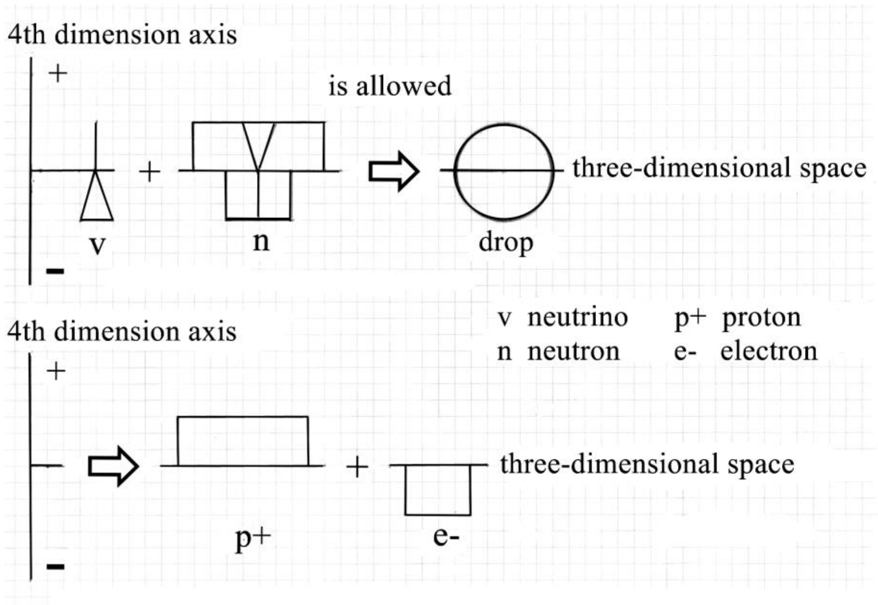

Fig. 10. Interaction of a neutron with a neutrino

And the interaction of a neutron with an antineutrino in Fig. 11 is prohibited.

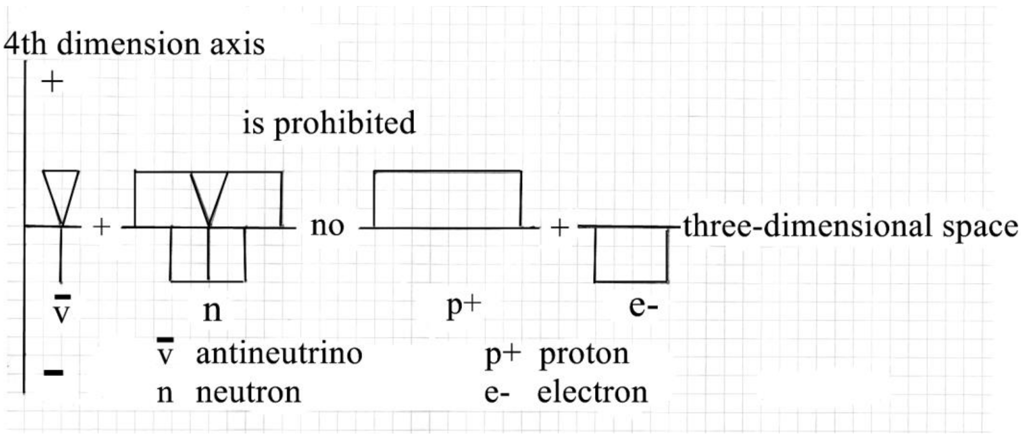

Fig. 11. Interaction of a neutron with an antineutrino

The essence of the permission is that inside the drop, which is formed at the connection of the neutrino with the neutron, there is an annihilation of the breakdowns into the fourth dimension. And the prohibition is that the annihilation process cannot take place when an antineutrino interacts with the neutron, so there is no reaction. Let us consider how a neutron from the proton and the electron can be formed. In Fig. 12, when the proton and the electron join, first a drop is formed in which interaction and birth of breakdowns into the fourth dimension take place.

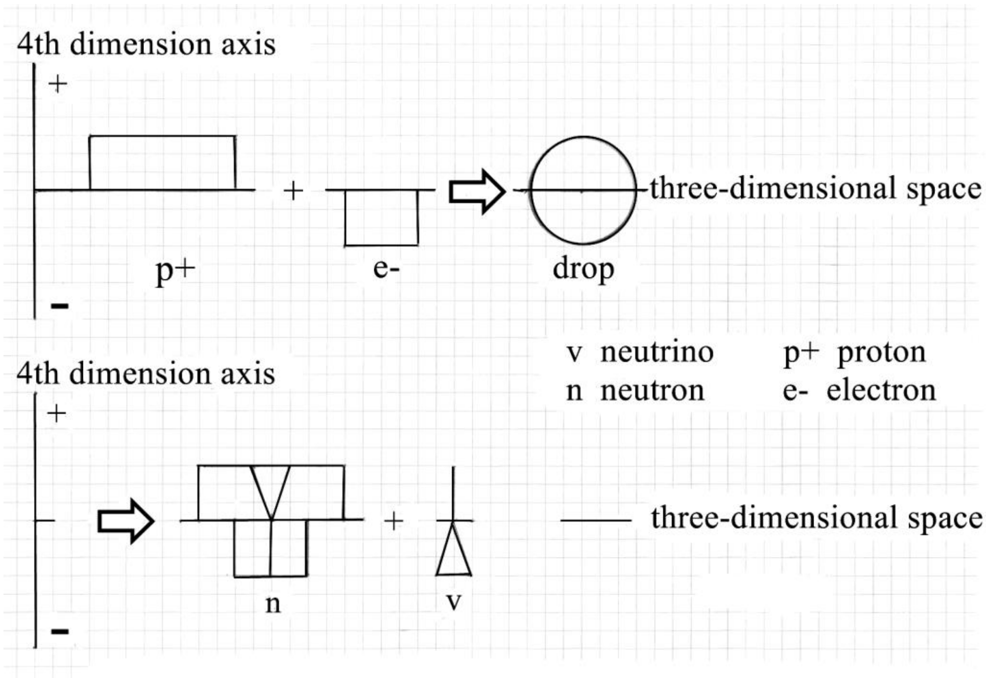

Fig. 12. Interaction of a proton with an electron

As a result, we have that one combination of breakdowns of the first and second kind comes out in the form of a neutrino. And a neutron is formed separately, inside of which the opposite combination of breakdowns remains. One important consequence. Neutrinos or antineutrinos, as having breakdowns of both the first and second kind, can appear only from a drop. As already mentioned, inside the fourth dimension, in a neutrino, there is a rotation of a wave of quanta of space. Hence, there is both the energy of this rotation and the mass of the neutrino. The excitation energies of the drop from which neutrinos can appear can be different. And, the appearing neutrinos can have different internal energies in the fourth dimension. There are stable levels for these energies, and transitions between these levels are possible. The formation of a neutron, in Fig. 12, gives the lowest neutrino energy in the fourth dimension. From droplets with higher energy, neutrinos with a higher energy level may appear. This all applies equally to antineutrinos. Neutrino and antineutrino, with us, can be different in mass. In another concept of neutrinos, its mass is zero [2, p. 559].

THE NATURE OF CONSERVATION LAWS.

Consider the laws arising from the presence of the fourth dimension in particles, and which are intuitive.

1) Conservation of rotation in the fourth spatial dimension.

2) Conservation of breakdown in the fourth dimension and its kind.

3) The annihilation of breakdowns in the fourth dimension can occur only if breakdowns merge in the drop are the same kind, in different directions.

4) Breakdown in the fourth dimension can occur only in a drop.

5) Only a symmetrical breakdown can be formed, in plus and minus, into the fourth spatial dimension.

6) The breakdown depth, in the fourth dimension, is the same for the breakdown of the first kind, and for the second kind.

Point 1 implies the law of conservation of spin during interactions and decays of elementary particles. According to the ideas of this article about a drop and a semi drop, the spin of an elementary particle can be either 1/2 or 0. Point 2 defines the law of conservation of charge, in the interaction or decay, of elementary particles. It also determines the impossibility of transforming a proton, with a breakdown of the second kind, into a positron, in which a breakdown of the first kind, or vice versa. Point 3 allows the possibility of annihilation of elementary particles, that is, the possibility of destroying their charges. Points 4 and 5 determine the correct description of the decay processes and the interaction of elementary particles in our tale. Point 5 is valid for the small curvature of three-dimensional space, and not at the very first moment of our Big Bang, when the curvature of three-dimensional space was large. From point 6 it follows that for an electron, proton, and unstable elementary particles, the magnitude of the breakdown in the fourth dimension is the same in magnitude and equal to the magnitude of the breakdown of the electron. The charge of an electron, proton, all unstable elementary particles, modulo, is the same. The breakdown depth equal to 1/3 of q cannot be. Therefore, the charge 1/3 of the charge of the electron can not be. Quarks [3] are particles from a fairy tale.

DECAY AND INTERACTION OF SOME
ELEMENTARY PARTICLES.

Let us consider the decay and interaction of some elementary particles in terms of a drop and a semi drop. We must say right away that until a semi drop collides with the nucleus of an atom, semi drop will retain its breakdown into the fourth dimension. And if it collides with the nucleus of an atom, and a drop forms, then depending on the energy of such a drop, there may be various decays. Applying the concepts of drop and semi drop, we obtain the values of the spins of elementary particles that they should have in our article.

MU MESONS.

Mu meson [4, p.17] a particle (matter), is the mu meson(-), and the mu meson(+), it is an antiparticle. Mu meson(-) is depicted in Fig. 13. In our article, these are semi drop. Excited state of breakdown of the first kind. There is a rotation in the fourth dimension. The spin is 1/2.

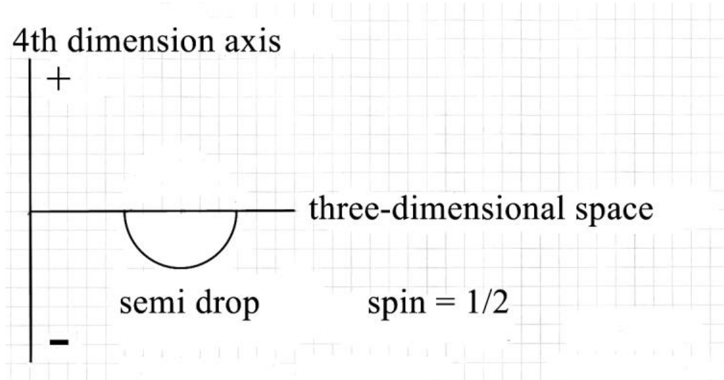

Fig. 13. Mu meson(-)

A simplified mu meson(-) decay scheme is shown in Diagram 1:

Mu meson(-) ====> electron + neutrino + antineutrino

But, a neutrino, or an antineutrino can come out only from a drop. So how do they appear. We will explain. Mu meson(-) collides with a particle that has a plus. For example, with a proton in the atomic nucleus. Drop formation during the interaction of mu meson(-) with a proton is shown in Fig. 14.

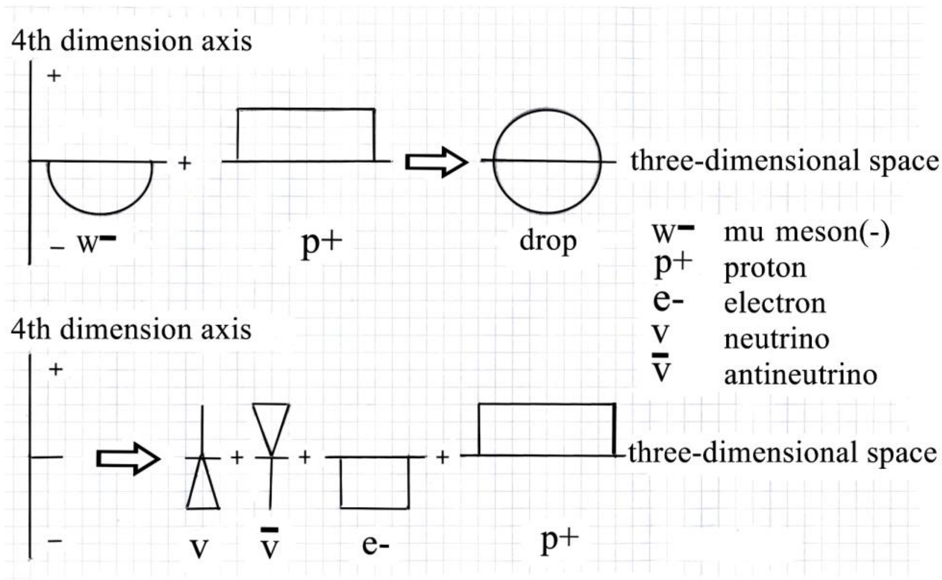

Fig. 14 Interaction of mu meson(-) with proton

As a result of the decay of the drop, neutrinos, antineutrinos, an electron and a proton appear. A simplified version of this decay is shown in diagram 1.

PI MESONS.

In Fig. 15 shows pi mesons [4, p. 32] in our view.

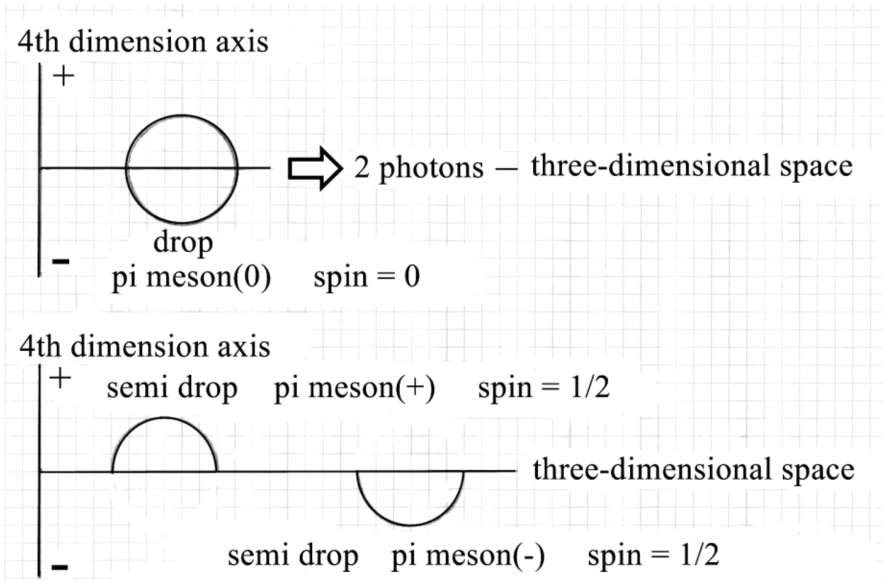

Fig. 15. Pi mesons

Unlike mu mesons, pi mesons are attributed to a quark composition, only because the matter is pi meson (+), and its interaction with the atomic nucleus is observed. The decay of pi meson(0) is annihilation, the decay of a drop into two photons. Inside the drop, the fourth dimension is destroyed. The spin of the pi meson(0) is 0. For pi meson(-) and pi meson(+), in Fig. 15, the spins are shown as 1/2. And by the example of decay we will prove that this is the case and the conservation of the spin is observed. Interaction of pi meson(+) with the atomic nucleus is its interaction with the neutron. Upon interaction we obtain a drop, which then decays, as in Fig. 9. At the beginning, the object Z1 is a semi drop of pi meson(+), and in the end the object Z2, this is a semi drop with less energy, that is, mu meson(+). Pi meson(+) reacted with the atomic nucleus. The fusion of a proton and an electron occurs immediately, in a drop, in the nucleus of an atom, and it gives a neutron and a neutrino, as in Fig. 12. The general scheme of this reaction is shown in Fig. 16.

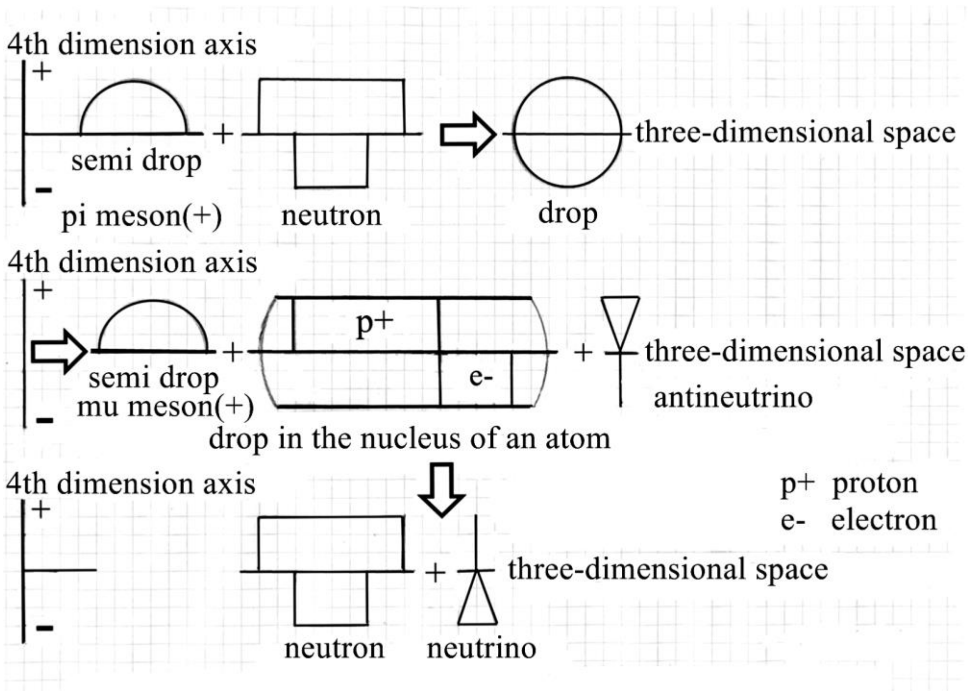

Fig. 16. Interaction pi meson(+) with a neutron

A simplified pi meson(+) decay scheme is shown in Diagram 2:

pi meson(+) ====> mu meson(+) + neutrino + antineutrino

spin 1/2 1/2 1/2 1/2

As we can see, strictly following the instruction on the decay of the excited neutron, and then the instruction on the fusion of the electron and the proton, we have shown where, at the decay of pi meson(+) particles, neutrinos and antineutrinos come from.

K MESONS.

K mesons [4, p.35], having a charge are semi drops, therefore it should have a spin equal to 1/2. Particle (matter), is a k meson(+). Considering the drop and semi drop scheme, it is easy to show that simplified decay schemes, are shown in Diagram 3:

k meson(+) ====> mu meson(+) + neutrino + antineutrino
spin 1/2 1/2 1/2 1/2
k meson(+) => pi meson(0) + mu meson(+) + neutrino + antineutrino
spin 1/2 0 1/2 1/2 1/2

Also, in Diagram 3, the spins of the particles are shown. And there will be several options for decay, since different energies of the drop are possible. Thus, the k meson(+) and k meson(-), with us, have a spin equal to 1/2, as its are semi drops. The spin of a drop of pi meson(0) is 0.

OMEGA MINUS HYPERON.

Omega minus hyperon [4, p.30] is a semi drop with a minus charge. Omega minus hyperon has a huge mass. A very interesting case. Despite such a mass, in omega minus hyperon, inside the semi drop is a breakdown of the first kind. That is, after a series of decays, we can only get an electron as a stable state with a breakdown of the first kind in minus. The most likely simplified omega minus hyperon decay schemes are shown in Diagram 4:

omega minus hyperon ====> lambda hyperon(0) + k meson(-)
spin 1/2 0 1/2
omega minus hyperon ====> xi hyperon(0) + pi meson(-)
spin 1/2 0 1/2

Lambda hyperon(0) [4, p. 30] and xi hyperon(0) [4, p.30], here, it's a drops, its spin are 0. And the particle's spin, omega minus hyperon, is 1/2.

WHAT THE BIG BANG CAME FROM,
CRYSTAL VACUUM.

Let's try, mentally, our entire Universe, to contract it into one point. First, there is a common black hole, which is a large neutron star. We compress further. Neutrons merge into each other. All breakdowns in the fourth dimension stick together. The three-dimensional space is already small, strongly curved, and all individual breakdowns are merged together. That is, the fourth dimension becomes general and continuous for particles. But you can talk about particles if each has its own breakdown. But that's not there anymore. We have a continuous four-dimensional spatial formation filled with quanta of space. Let's call it crystalline vacuum. With further compression, there is enough energy for the appearance of the fifth spatial dimension, at specific points in four-dimensional space. The total quantity of quanta of space in the entire Universe (TQQ) is related to the total energy of the Universe (TEU). The significance of the TQQ, albeit very large, but not infinite. So, there will be the final stage of the compression process. It is impossible to compress further, the TEU will determine the last formation, from the quanta of space, with some dimension. There will come an equilibrium determined by the values of TQQ and TEU. And what could upset such a balance? What is the reason for the Big Bang? We will answer. Change in the TEU, without changing the value of the TQQ. This will cause an imbalance. The inverse process of reducing dimensionality leads to an avalanche-like release of a huge amount of energy. This is a Big Bang. The fact of the Big Bang speaks of the finiteness of the significance of TQQ for our Universe. And the fact that the TQQ is not equal to infinity leads to the conclusion that the quantum of space also has, albeit small, but not equal to zero, a value. Therefore, if there was a Big Bang in our Universe, then this is proof of the discreteness of space in the Universe. The process of transition of crystalline vacuum into three-dimensional vacuum let's call evaporation of vacuum. In this case, where evaporation occurred, the possibility of breakdowns arises back to the fourth dimension. Electron-proton pairs are born only in the first instant, when the curvature of three-dimensional space is large, then only pairs that are symmetric in mass. And then the formation of the first hydrogen atoms. And now, inside our Universe, there are remnants of a crystalline vacuum, and evaporation is still ongoing. As the crystalline vacuum evaporates, the three-dimensional Universe expands. When it all evaporates, the expansion of the three-dimensional Universe will end. In the first instant, after the Big Bang, the five-dimensional vacuum passed into four-dimensional. This transition predetermined the value of q, the depth of the fourth dimension. Further, only three-dimensional space expands. Thus, the magnitude of the charge of the electron and the proton, and their mass, are predetermined by the values of the parameters of the TQQ and TEU. What could lead to a change in the TEU? A collision with another similar multidimensional formation, which has its own values of TEU and TQQ, is supposed.

GRAVITATIONAL INTERACTION,
ELECTRICAL ATTRACTION AND REPULSION,
DARK ENERGY.

The energy density of the quanta of space, hereinafter referred to as the density, determines the pressure in the fourth dimension of an elementary particle, which is in equilibrium with pressure, in the three-dimensional component of the same particle. Our proton is a stable state of a four-dimensional object, with its density. The vacuum around the proton is a three-dimensional object. It also has its own density. Both proton and vacuum consist of quanta of space. There is an interaction between the proton and the vacuum, which does not upset the equilibrium between the proton density and the vacuum density. The proton exerts pressure (F proton) on the quanta of the vacuum surrounded by the proton. Also, vacuum quanta exert pressure (F vacuum) on the proton. This is shown schematically in Fig. 17, where Av is any point in space around a proton. With increasing distance from the considered point of vacuum Av to the proton, their mutual pressure on each other decreases.

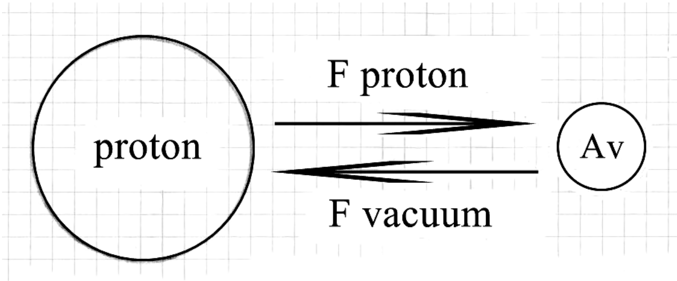

Fig. 17. Interaction of a proton with a vacuum

Consider the interaction of two protons. We'll assign them numbers 1 and 2. First, consider the interaction of their three-dimensional components. In Fig. 18 point Av, this is the middle of the distance between protons.

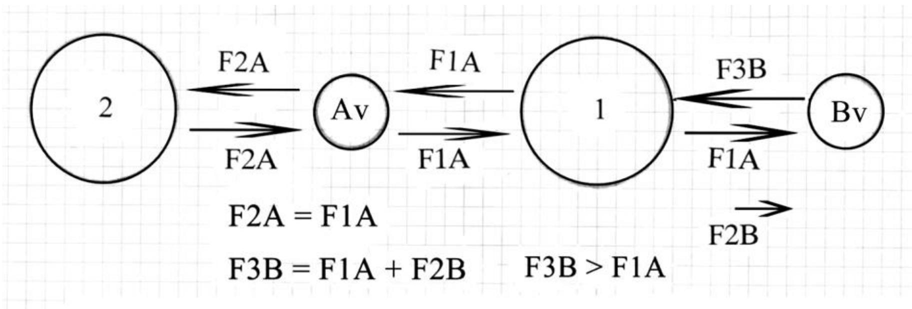

Fig. 18. Gravitational interaction of protons

In point Av , the pressure F1A on the vacuum from the side of proton 1 is equal to the pressure F2A from the side of proton 2. The directions are strictly opposite. The total pressure vector for vacuum is zero. And the point Av itself, also exerts pressure F1A on the proton 1. Point Bv is located from proton 1 at the same distance as point Av, but only in the opposite direction of three-dimensional space. In it, both protons exert pressure on the vacuum. The pressure of proton 1 is equal to F1A. The pressure of proton 2 at point Bv is F2B. Total proton pressure F3B = F1A + F2B. The return pressure of a vacuum is also F3B. The pressure of F3B is greater than F1A. We get that the vacuum located between our protons presses on them weaker than that located outside, at the same distance. The three-dimensional component of our protons, as four-dimensional objects, makes them come closer. Now consider the interaction of constituent protons in the fourth spatial dimension. In Fig. 19 plane, this is our three-dimensional space. The fourth dimension is perpendicular to him. At points 1 and 2 are protons. Point Av is the middle in three-dimensional space between proton 1 and proton 2.

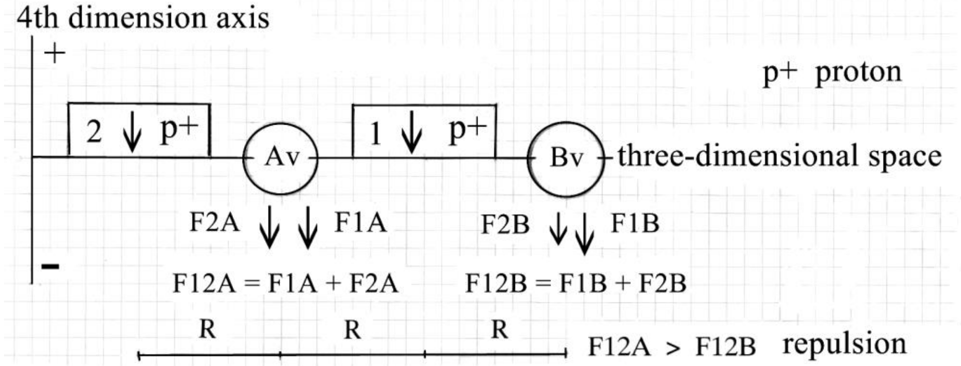

Fig. 19. Breakdown pressure of two protons

The breakdown pressure of protons 1 and 2 at the point Av is added up. F1A is the pressure of breakdown into the three-dimensional space at the point Av from proton 1, F2A is the pressure of breakdown into the three-dimensional space at the point Av from proton 2. Total pressure F12A = F1A + F2A. At point Bv, located from proton 1 at the same distance as point Av, but in exactly the opposite direction, we have pressure F1B from proton 1 and pressure F2B from proton 2. Total pressure F12B = F1B + F2B. Since at the point Bv the pressure of the proton 2 is weaker than at the point Av, we get that F12A is greater than F12B. The response pressure of the vacuum, in three-dimensional space at point Av, and on proton 1, and on proton 2 is greater than on proton 1 at point Bv. The fourth component of space, which is inside our protons, make them push off from each other. Now, instead of proton 2, we take antiproton 2. In Fig. 20 point Av is located in the middle between the proton 1 and the antiproton 2, in three-dimensional space.

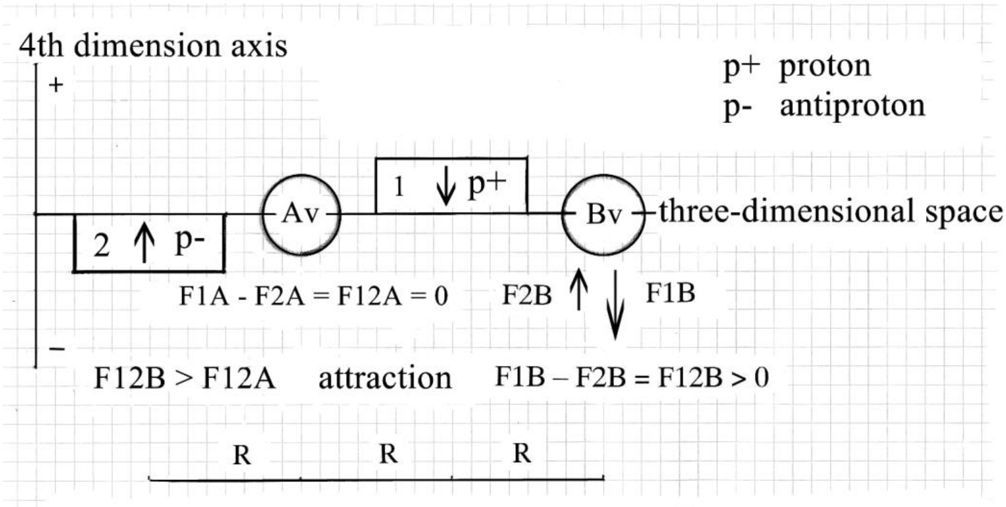

Fig. 20. Breakdown pressure from proton and antiproton

Point Bv is located from proton 1 at the same distance as point Av, but in the opposite direction. Since the proton and antiproton press in the fourth dimension the same way, on three-dimensional space, but in opposite directions, their total pressure F12A, at point Av, will be zero. At point Bv, we have the pressure F1B of proton 1 and the pressure F2B of antiproton 2. Since proton 1 is closer to point Bv than antiproton 2, the value F12B = F1B - F2B is greater than zero. So, at point Bv, there will be pressure on the three-dimensional space, modulo, greater than zero. Vacuum response pressure will lead to the attraction of the proton and antiproton. So, gravity, is the result of interaction with the vacuum of the three-dimensional component of our particles. Electric attraction, or repulsion, is the result of the pressure of breakdowns, in the fourth dimension, onto three-dimensional space. Further, some consequences of our article.

In Fig. 21 depicts, in the form of a sphere, a three-dimensional Universe.

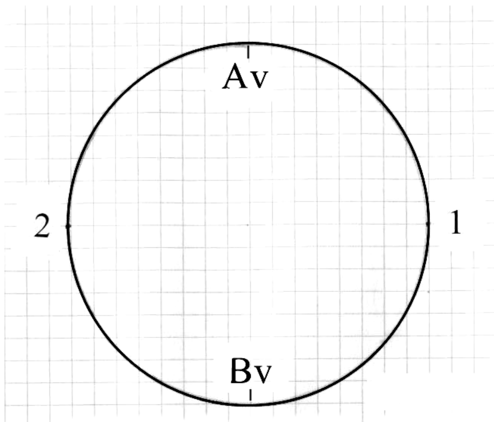

Fig. 21. Three-dimensional Universe

Let some object C1 be located at point 1. By the word object, further, we can mean a star, galaxy, or a cloud of hydrogen. For an object at point 1, there is such a point 2, in the universe, that situation in Fig.18 will give equality of vacuum pressures from points Av and Bv on object C1. The distance between the points, determined by the time that light travels from point 1 to point 2, is comparable to the age of the Universe. In fact, they are located at opposite ends of the Universe. In Fig. 22 shows a situation where F1A = F3B.

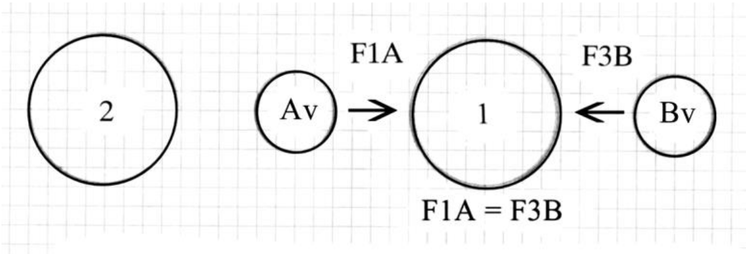

Fig. 22. Lack of attraction

If at point 2 there is an object C2, then we get that the objects C1 and C2 do not attract and do not repel. The attraction between them caused by the three-dimensional component is zero.

Now let between our objects C1 and C2, which are located at points 1 and 2, be the remainder of the crystalline vacuum. In Fig.23, this is object C3 at point 3.

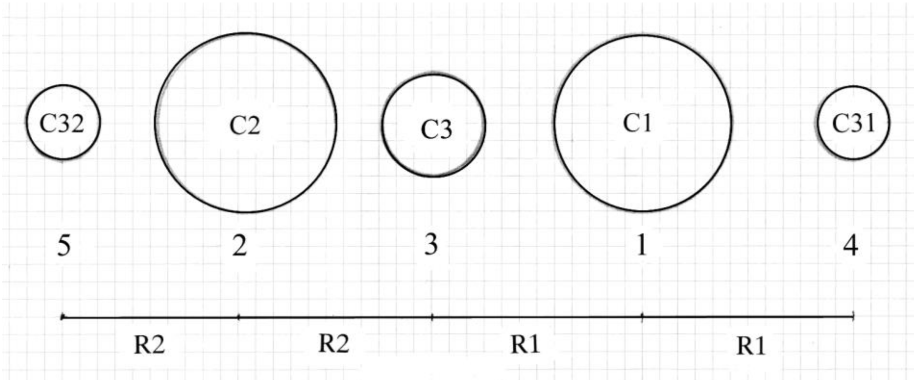

Fig. 23. Scheme of gravitational repulsion

At points 4 and 5 we have a three-dimensional vacuum C31 and C32. The distance between points 1 and 3 is equal to the distance between points 1 and 4. The distance between points 2 and 3 is equal to the distance between points 2 and 5. Crystal vacuum C3 creates additional pressure on objects C1 and C2. As a result, the pressure from point 3 on object C1 is greater than from point 4. Correspondingly, the pressure from point 3 is higher on object C2 than from point 5. Therefore, if between objects at points 1 and 2, in Fig. 21, there is a region with crystalline vacuum, then repulsion will act between them. The crystalline vacuum, is the dark energy that pushes objects in the Universe. Note that around the place where the crystal vacuum is located, the density of the substance will be very small. Such places in the Universe are called voids. And the photons passing through the voids will interact with the crystal vacuum and the light will be refracted. In different directions from the Earth, the distribution of the remnants of the crystalline vacuum is not uniform, therefore the expansion of the Universe in different directions is not uniform.

DARK MATTER.

We need the need for dark matter to explain, say, not the scattering of stars in galaxies, when they rotate around the centers of galaxies. Without the dark matter that pulls them toward the center of the galaxies, the stars should have been removed , rather than rotate, around the centers of the galaxies, in the center of which are black holes. Could, still not open, stable heavy neutral particles exist. In our article, a stable neutral particle must contain two breakdowns in the fourth dimension at once. And these breakdowns must be of various kinds so that there is no annihilation. A neutron-type compound, but only with a heavy electron and a heavy proton, is excluded, since ordinary electron and proton are the only stable states for breakdowns of the first and second kind. Now let's look at a neutrinos or antineutrinos filled with a large number of quanta of space. The rotation in the fourth dimension, in such a connection, should be directed in one direction. The spin of this particle is 1/2. Fig. 24 shows, schematically, heavy neutrinos and antineutrinos.

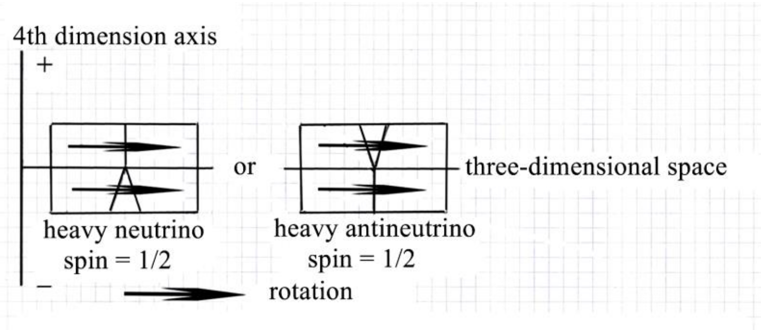

Fig. 24. Heavy neutrinos and antineutrinos

Such a particle, with a large mass, can be stable only hypothetically. Collision of it, with something, will lead to the formation of a drop. The decay of this drop will lead to the transition of heavy neutrinos or antineutrinos into ordinary neutrinos and antineutrinos. Consider another consequence of our article. An electron, proton, neutron interact with the quanta of space, and consist of quanta of space. When these particles move, the density of these four-dimensional particles increases. This means that they can draw in quanta of space into themselves, or return them back to a free vacuum. It turns out that a moving particle can drag out quanta of space that are in the vicinity of the particle in a vacuum. Conversely, a moving stream of quanta of space will drag particles along with it. If you take a massive object that rotates around its own axis, it will cause the quanta of space that are outside this object to move around it. Stars in a galaxy that revolve around a black hole move in a vacuum stream. And they cannot escape from this stream. This is shown schematically in Fig. 25.

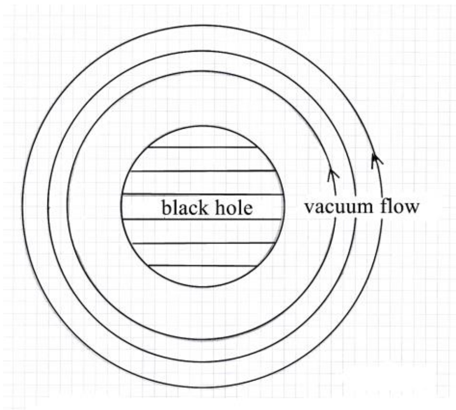

Fig. 25. Vacuum rotation

After the Big Bang, the formation of a three-dimensional vacuum led to large flows of this vacuum. If the formation of galaxies occurs inside such a stream, subsequently, then they will continue to move together, inside this stream. That is, the vacuum flows can move along a closed path around massive bodies, and along longitudinal paths inside the universe. Thus, dark matter, which makes objects in the Universe move together, is a moving stream of vacuum. To break out of such a stream, the objects are prevented by the vacuum itself.

CONCLUSION.

I would like to hope that the assumption of the fourth spatial dimension, which in this article explains the essence of the charge of elementary particles, their structure, as well as the expansion of the Universe, will correspond to reality. Although there is some benefit in fairy tales as well.

Список литературы / References

1. *Ishkhanov B.S., Kapitonov I.M., Yudin N.P.* Particles and atomic nuclei. LKI publishing house, 2007 [in Russian].
2. *Zel'dovich Ya.B.* Problems of modern physics and astronomy // Uspekhi fizicheskikh nauk, 1962. Vol. 78 (4) [in Russian].
3. *Gell-Mann M.* Quarks. CERN. Acta Phys. Austriaca Suppl. 9 (1972). P. 733-761.
4. *Ding-Yu Chung,* The periodic table of elementary particles. P.O.Box 180661, Utica, Michigan 48318, USA.