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About Matter and Space

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Abstract

For further development of physics it is necessary to reexamine its fundamental notions, as the concept about matter and space existing nowadays.

It is applicable and correct: to divide material objects into three forms or levels: (primary, secondary and tertiary); belonging more delicate objects compared with primary matter to differentiated type of matters. The author thinks that it is necessary the matter space to return the status of absoluteness, provided by I. Newton. To be accepted that forming of the space preceded formation of solid material objects. Space is discrete, non-homogenous, electrically neutral, motionless (doesn't move), has the ability to vibrate. It consists of special, most delicate types of matter. The solid massive bodies consisting of tertiary matter include great pores and they can't curve the space. Space is their important component.

Matter and space present the fundamental notions of physics. Every important step made for the development of science required explorers to review and broaden the knowledge about these foundations. Matter is the base, substratum, substance for every real object and system existing in the universe. All known different types of states of substance belong to matter: plasma, gas, liquid, solid. Some scientists refer them to cosmic rays, neutrino and other massless proportions and fields. The forms (levels) of matter, their qualitative base differences are various and each of them has specific character, structure, unity of stable connections. It is known that while existing character type differences of these connections you may talk about the state of defined matter. Modern physics recognizes the following types of the state of matter: elementary particles and fields, atoms, molecules, microscopic bodies, planets, stars, inner galactic systems, galaxies, galactic systems. There are also its completely unnatural forms in such astronomic objects as neutron stars, black holes and others. After developing of quantum theory, the process of cognition in physics changed and the attention was attracted on more delicate forms of matter. There is the opinion, that studying of elementary particles helps us to learn deeper laws of the universe.

Modern physicist tries to known the origin of the mass of quarks, electrons and other elementary particles and how the particles with electric charge are created. The scientists have already reached the resolution to this question [1].

It is clear that substance is made from energy. And the latter is the constant component of the universe. Many modern physicists think that the continuous process of creation new substances

takes place in the universe, agrees with the ideas of W. Heisenberg and K. Paul that the particles and forces present the exposure of deeper quantum fields of realty. Particles are combined energy of different fields [1].

There is the concept that the electron is born along with spreading of the light by participation of particles created in space microstructures, in the points where light beam crosses its wavy part scheme [2]. By piling radial and wavy energies there is formed such energy quantity that is enough to transform the virtual electron into real electron. There may be the idea that newly born free electron, which moves in high speed with light wave in the space will meet nucleus which will attract it and make it as its companion. So is made the first atom-hydrogen. It is clear that the processes of appearing, disappearing and intertransmitting of virtual and elementary particles and also other particles that are included in the matter are constantly running in the universe [1]. The knowledge about matter existing in scientific literature doesn't give us the base to believe that definition of the forms of matter made by physicists is appropriately approved and is close to realty [3.4].

We think it is right to divide all material objects into three forms: primary, secondary and tertiary ones. Such division corresponds to the interaction of three varieties – nuclear, electromagnetic and gravitational. Besides mentioned forms there are also the most delicate types of matter, fields of different energy, light, warmth and others. Statements on this kind of classification is reffered in modern literature, but leading physicists has no paid attention on this issue yet. Among the forms of matter the most delicate form of matter is the primary matter. All virtual particles – protoelements are included to it. They are made from energetic field when its energy reaches special importance. The secondary matter is more solid. All elementary particles belong to it. It is made from the energetic field of the primary matter when its concentration exceeds the special limit. From the secondary matter is made plasma; it is also the component part of the space existing around the stars. The tertiary matter is the most solid one. They are atomic particles. It is made from energetic field of the secondary matter, when the latter reaches the special limit and exceeds it. All the solid physical surrounding, subject, body and object are included in the list of the tertiary matter.

The concept that the process of creation and development of matter is directed from the most delicate objects to solid forms and not vice-versa is close to realty. The idea, that forming of space precedes the process of formation of matter and substance in space should be true and the latter is made form the most delicate creations – special varieties of matter.

In the past in atomic theory of Democritus and in cosmology space wasn't discussed as void. According to his supposition, there are native elements distributed in the space. It is non-homogenous and has defined structure [5]. According to I. Newton space is objective and doesn't depend on concrete movements of the body. Attention should be attracted to the supposition of I. Newton that there are ethereal, unusually flexible substance are spread having the ability to contract and expand [6]. He wrote: "I think that ether that fills up the universe consists of particles that differ from each other in delicacy [6]. In XX century physicists noted that the ether mentioned by Newton which fills up the universe is very close to the space mentioned by Descartes and his "hierarchy of delicacy – is related to hierarchy of particles mentioned by Descartes [5]. I. Newton thought that general skeleton of nature is nothing but the net of different ethereal creations.

Following to his concept we can't conclude that the space is void". I. Newton refers ether the ability of oscillation. According to his conception real absolute space existed before creation of subjects [6]. According to the theory of I. Newton there is absolute motion existing (along with the relativity of motion of bodies) in relation with absolute space that is three dimensional and immovable.

At the end of XIX century H. Hertz and H. Lorentz made theories based on the concept that space is filled up with "ether of the world". According to the theory of H. Lorentz ether is motionless. It doesn't participate in the motion of material systems. This was the base for the existence of reference systems connected with motionless ether the same or the space. E. Mach criticized the supporters of the notions of absolute space: he thought that the mentioned concept was against general manual of classical science – the interaction of bodies as the reason for all happening in the universe. There is a question: was this "manual" really untouchable and true? From the standpoint of E. Mach the gravitational field is fully defined by the masses of the bodies and stars make the space [5]. The concepts of A. Einstein coincide with the principles of E. Mach. He thought that the construction of space exists as there are its creator stars, planets and other material bodies and systems. The first postulate of A. Einstein starts with the followings: "none of physical experiments held in laboratories (reference system) gives ability to know if this laboratory is in motionless state or moves equally and rectilinearly, that's' why the absolute motion isn't revealed and the absolute space of Newton is such a fiction as its material substrate – ether". In connection with this postulate there appears the natural question: is the impossibility of proving something by experiment under the condition of given knowledge and the level of technical development the hard evidence of its non-existence?

A. Einstein argued that space was non-homogenous and its geometrical structure is depended on distribution of masses, substance and the field. He took four-dimensional space-time notion and concept that in surrounding of great material bodies the structure of the bodies is non-euclidean so the space is curved. Here dominates geometry made by B. Riemann.

Physicists faced the following acute question: does space exist independently or is it made from substance? The majority of scientists thought that the characteristic features of space aren't depended on moving bodies existing in it, though many of them believed that local curving of space is formed by bodies.

The special theory of relativity by Al. Einstein overthrew ether and changed it by void space-surrounding carrying the impulses of elector-magnetic fields. His theories demoted space and granted it with general characteristic features of physical universe that are changed due to motion or gravitation [1].

It becomes clearer for modern physicists that the universe has special orderly structure and space is its level system. It is impossible to describe it by general mathematical methods that are used during examination of macro processes and natural phenomenon. The structure of space can be described only partially yet by the laws of modern science. The part of physicists argues that space is isotropic and all directions in it are equivalent. It is more probable that the complex structure of space is non-homogenous and non-isotropic. According to Mach micro space has grain type structure, so it is interrupted. The analogue opinion is expressed by Van-Danzig when he speaks about space quantum and the fact that the processes between them aren't subject to observe

[7]. I. Tamm also supposes that in microscopic scales it is possible the space to be discrete [8]. At the end of fifties of XX century it was experimentally stated that under the events of weak influence the law of keeping evenness is violated. Besides, there was created the necessity of reexamination of outlooks about characteristic features of the universe.

Modern physicists often talk about absoluteness of the space and relativity of such notions as homogeneity in space and isotropy. As deep and universal characteristic features of space there is acknowledged its objectivity and specificity as unity of matter form and type, unity of interruption and continuity and etc.

Logical discussion of the knowledge about space existing in science at the present time and private vision of its essence became the base for the conclusion below made by the author:

1) Space doesn't present only set proportions brought by scientists expressing coordination of coexisting objects – distance and orientation between them, their size and location in relation with each other as it was confirmed by some leading physicists.

2) The statement that absolute space doesn't exist made by scientists was a great mistake. The concept about existing of absolute space provided by I. Newton is true. Absolute space exists in realty and it is the source and base of material universe.

3) Forming of space preceded formation on material objects in it. It isn't made with stars.

4) From composition standpoint it is material type – it consists of special type of delicate matter, is discrete, small graining type, electrically neutral. Space grains are curved that plays important role in the events passing in space. Corns are distributed separately; the structure of space is similar to the surface of corn cob (Fig.).

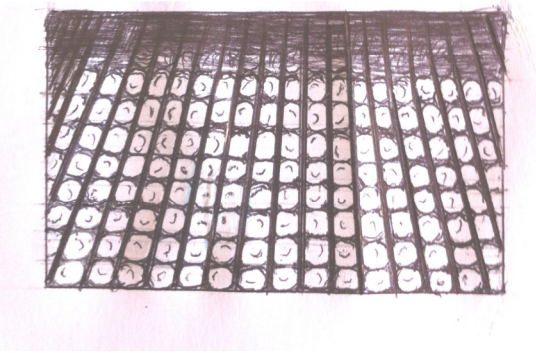

Fig.1 Approximate scheme of microstructure of space surface

5) Hard massive bodies existing in space, that are composed by the matter of tertiary form, don't curve it as they have great pores between atoms and molecules (in atoms emptiness takes huge place) and the space (that is resilient) fully exposures these bodies and is its important part. So, the concept that space due to the objects inside it, is curved doesn't correspond to realty.

6) Space is motionless from the standpoint that it doesn't move, but it has ability to vibrate and other very important characteristic features, creation of virtual particles, their development and etc.

Space is formed from emptiness (where there are many things, but there aren't matter and scientists called it as vacuum), inside it and combined in it, as its indivisible and important part - the base of grandiose and multiform material world, the initial source of evolution processes going there.

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მატერიისა და სივრცის შესახებ

ო. ლომაია

რეზიუმე

ფიზიკის შემდგომი განვითარებისთვის აუცილებელია მისი ფუნდამენტური ცნებების, კერძოდ - მატერიისა და სივრცის შესახებ ამჟამად არსებული შეხედულებების გადასინჯვა.

მიზანშეწონილად და სწორად არის მიჩნეული: მატერიალური ობიექტების სამ ფორმად ან დონედ დაყოფა (პირველადი, მეორადი და მესამეული); პირველად მატერიაზე უფრო ნატიფი ობიექტების მატერიის განსხვავებული სახეობებისადმი მიკუთვნება. ავტორი ფიქრობს, რომ საჭიროა სივრცეს მყარად დაუბრუნდეს აბსოლუტურობის სტატუსი,

რომელიც მას ი. ნიუტონმა მიანიჭა. აღიარებულ იქნას, რომ სივრცის წარმოშობა წინ უსწრებს მასში მყარი მატერიალური ობიექტების წარმოქმნას.

სივრცე დისკრეტულია, არაერთგვაროვანი, ელექტრულად ნეიტრალური, უძრავი (არ გადაადგილდება), ფლობს ვიბრირების უნარს. შედგება მატერიის განსაკუთრებული უნატიფესი სახეობისგან. მესამეული მატერიისაგან შემდგარი მკვრივი მასიური სხეულები შეიცავს დიდ ფორებს და მათ არ ძალუძთ სივრცის გამრუდება. სივრცე მათ განსჭვალავს და არის მათი მნიშვნელოვანი შემადგენელი ნაწილი.

К вопросу материи и пространства

О. Ломая

Резюме

Для дальнейшего развития физики необходимо пересмотреть и уточнить взгляды на некоторые фундаментальные основы физики, в частности - на материю и пространство.

Представляется обоснованным и целесообразным: принять деление всего многообразия материальных объектов на три формы (уровни) - первичную, вторичную и третичную; объекты более тонкие, чем первичная материя, отнести к различным видам материи.

Автор считает, что пространству надо вернуть статус абсолютности, предложенный И. Ньютоном, и признать, что образование пространства предшествует формированию в нём материальных объектов. Пространство дискретно, неоднородно, электрически нейтрально, неподвижно (не перемещается), обладает свойством вибрировать. Состоит из особого вида тончайшей материи. Плотные массивные тела из третичной материи, имеющие большие поры, не могут изгибать пространство, которое пронизывает все материальные объекты и составляет их важнейшую часть.