ФИЗИКО-МАТЕМАТИЧЕСКИЕ НАУКИ

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IMPORTANT ASPECTS OF THE PRINCIPLE: MATTER STRIVES FOR MAXIMUM (OR MAXIMUMS) FORMATION

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ВАЖНЫЕ АСПЕКТЫ ПРИНЦИПА: МАТЕРИЯ СТРЕМИТСЯ К ФОРМИРОВАНИЮ МАКСИМУМА (ИЛИ МАКСИМУМОВ)

Аннотация. Общие результаты по исследованию экзопланет подтверждают правильность принципа, материя стремится к формированию максимума или максимумов. Впервые такой принцип был получен исходя из анализа распределение масс между небесными телами Солнечной системы. Также было рассмотрено распределение массы в атомах химических элементов среди ядер и окружающих их электронов. Важно заметить, что принципы наименьшего действия не отрицаются.

Abstract. The research of exoplanets confirms the principle: matter strives for maximum (or maximums) formation. The principle has been obtained from the analysis of mass distribution in cosmos objects in Solar system. The analysis of mass distribution in atoms between nuclei and electrons also supports this principle. The theory does not contradict the principles of minimization.

Ключевые слова: максимум, материя, звезда, экзопланета.
Keywords: maximum, matter, star, exoplanet.

Introduction. The principle of matter existence considered in this study was first suggested recently in [1-3]. Matter is distributed everywhere in cosmos, it is huge and diverse. However, how the principle works can be understood only if we turn to the structure of our Solar System. We shall analyze mass distribution of Sun and the surrounding planets.

Theoretical analysis. As known from astrophysics [4, 5], Sun contains 99.866% of the total mass of Solar system. So, the mass of the other planets including Mercury, Venus, Earth and huge Jupiter comprises a bit less than 0.14 % of the total mass.

The planets very much differ in mass from one another. However, obvious ratio is that the mass of Sun is a thousand or hundreds of thousand times greater than the mass of the planets around. Mathematically, the much greater maximum of mass than small mass maximums corresponding to Solar System planets is belong to Sun. Therefore, in the macroworld and in Solar System in particular, the principle works, which is matter strives for maximum

$$\text{matter} \rightarrow \text{maximum formation} \qquad (1)$$

At the same time our Solar System is a relatively solitary cosmic structure, since it is distant from the closest star more than four light years, which allows the performance of the given analysis.

One of the ways to present this as a graph is as follows. Suppose the center of three dimensional Decartes coordinate system (0 on each of the three axes x, y, z) is placed in the center of Sun. On the horizontal plane space with axes x,y, each of the planets possesses certain coordinates. Their masses are shown on the vertical axes z. In this case the mass greatest value will coincide with the coordinates of Sun in the center of the graph, while the coordinates of each of the planets will be associated with the values of masses which are thousands of times smaller.

As long ago as the times when Rutherford-Bohr model of hydrogen atom was developed, as well as those of other elements, a certain similarity between the atoms of chemical elements and Solar system was noted. Focusing on the fact that there is a heavy positively charged nucleus in the center of atom, whose mass is 1840 times as large as the electron mass [4], the aspects we are interested in become quite obvious. In some other atoms the difference between the masses, with the mass of the nucleus being still greater, is even more essential, since the nuclei of some other atoms contain more nucleons and therefore have greater atomic masses. Thus, for the atoms of different chemical elements, that is for the microworld, the same

principle that matter strives for maximum holds as well, since the atomic nucleus represents a sharp maximum in distribution of mass between nucleus and electrons in the atom [1]. The principle holds for the distribution of electron probability density in the atom as well, since striving for maximums is also peculiar to this physical quantity.

The suggested principle that works both in macro- and microcosm can be more accurate if we take into account that a considerable number of stars in the Universe are double (or even multiple) stars. Therefore, the principle is better formulated as follows: matter strives not just to form a maximum but it strives toward maximum or maximums. This formulation agrees with the cosmological theory of the Universe. If before the moment of big explosion all the matter was concentrated in a single point, the matter had strived toward maximum. After big explosion , which was followed by the Universe expansion with the formation of stellar structure, matter strives for maximums since every star can be put into correspondence with a maximum (or maximums) of mass with respect to the bodies surrounding it

matter → maximum (or maximums) formation (2)

It should be noted that the very existence of a single planet or several planets on the orbits around star is very important for our analysis. Althouth the star is also heavier in mass than nearby asteroids, comets, meteorites, sand small particles of dust nebulae or molecules of gas nebulae, which is also of great importance. No less important for the principle basement are the results of research of exoplanets, that is the planets outside Solar System. For a long time, astronomers had been making efforts to find planets of this kind in the faraway space. However, the technical capabilities of the best telescopes had not allowed them to realize this task. The researchers have moved forward in solving this problem only over the last 25 years by using the best ground telescopes and new space ones. By May 2020 the existence of over four thousand exoplanets in over three thousand cosmic structures have been proved [6, 7]. This allowed a prediction to be made about many the existence of astronomical structures (much more than those found experimentally) in the Universe where exoplanets rotate around the central star [6, 8].

Thus, the results obtained from research in exoplanets support the validity of the principle that matter strives to form maximum or maximums. This is proved by the fact that exoplanets are smaller in mass than the star at they turn around.

However, in addition to cosmic structures such as the star and the planets around it (or asteroids, comets, meteorites, sand small particles of dust nebulae or molecules of gas nebulae) there are also other interesting formations for which this principle holds as well. They are spiral or elliptical and other galaxies in the center of which there is a black hole, whose mass exceeds the mass of the surrounding stars. In this case, that is in the system black hole with the surrounding stars, the principle that matter strives to form maximum or maximums holds as well.

Conclusions. One of the most important aspects of nature is the principle that matter strives for maximum (or maximums) formation.

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Список литературы.

1. Stetsun A. Principles of nature//Journal of Modern Physics. 2018, vol. 9, №3, P. 320-334.

2. Stetsun A.I.. Maximalization in nature//Authors right and adjacent rights. K.: 2007, №13, P.81. (in Russian).

3. Stetsun A.I. Principle, matter strives for maximum (or maximums) formation//East European Scientific Journal. 2019, Vol. 9, N 5 (45), pdf. 3, p.52-53. (in Russian).

4. Physical encyclopaedic dictionary// M.: Soviet encyclopedia, vol. 1-5, 576 P., 1960.

5. Martinov D. Ya. Course of general astrophysics//M.: Science, 640 P., 1979.

6.http://ru.m.wikipedia.org/wiki/exoplanet/ 2020

7. Valyavin G.G., Gadelshin D.R., Valeyev A. F. et al. Photometrical analyses transmittion spetra of definite exoplanets//Astrophysical bulletin. 2018, vol. 73, № 2, P. 234-244. (in Russian).

8. Gadelshin D.R., Valyavin G.G., Yushkeen M.V. et al. Spectroscopic confirmation of exoplanets existence which was discovered with help of Kepler telescope// Astrophysical bulletin. 2017, vol. 72, № 3, P. 361-370. (in Russian).