ИЗВЕСТИЯ УФИМСКОГО НАУЧНОГО ЦЕНТРА РАН. 2021. № 2. С. 60–63

ФИЗИКА

УДК 530.12; 530.145.1
DOI: 10.31040/2222-8349-2021-0-2-60-63

FROM GENERAL RELATIVITY THEORY TO QUANTUM PHYSICS, BLACK HOLES, AND WORMHOLES

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Problems of modern physics are considered, including the impossibility of creating a physical and mathematical theory of everything that describes all fundamental interactions at once, namely gravitational, electromagnetic, strong and weak. The analysis of the general relativity theory is carried out, as a result of which an alternative equation is proposed that describes the time difference between the two reporting systems. The resulting equation has a logical linear form. The fundamental quantum physics equation is also considered – the Schrödinger equation. Based on the general relativity theory, a theory was proposed according to which time stops completely for an object moving at the speed of light. The presented equation of the relativity theory suggests that the object can grow in momentum more than the speed of light. A black hole allows the object to develop such speed, once in which time passes by in the opposite direction and the object returns to the past through wormholes. The maximum speed of an object passing through a wormhole is presented.

Key words: general relativity theory, Albert Einstein, Galilean transformations, Hendrik Lorentz, quantum physics, Erwin Schrödinger, theory of everything, black holes, wormholes, Stephen Hawking, universe, Big Bang theory.

1. Introduction. Today, one of the main problems in physics is the construction of a theory of everything that can combine both the relativity theory and quantum physics [1]. In the direction of the relativity theory [2–8], the first steps were done by Galileo Galilei in his reflective experiment with two reporting systems. He suggested that the time in different systems will flow differently if the speeds of objects in these systems are also different. However, the derived equations contained a number of flaws, which Hendrik Lorentz proposed to correct. Like the Galileo equations, the Lorentz equations were not fair enough. In a fixed system, a certain point in time corresponded to an unlimited number of values in a moving system. The problem was solved by Albert Einstein, who introduced the following dependence to the world:

$$t' = t - \left(1 - \sqrt{1 - \frac{u^2}{c^2}}\right) \cdot t \, , \qquad (1)$$

where t' – is the time difference between a standing and moving object in t seconds, s; t – is the time of observation (relative to a nonmoving object), s; u – is the object speed, m/s; c – is the speed of light, m/s.

The equation derived by Einstein formed the basis of the general relativity theory and is still used today. Let us consider graphically the results derived on its basis (Fig. 1).

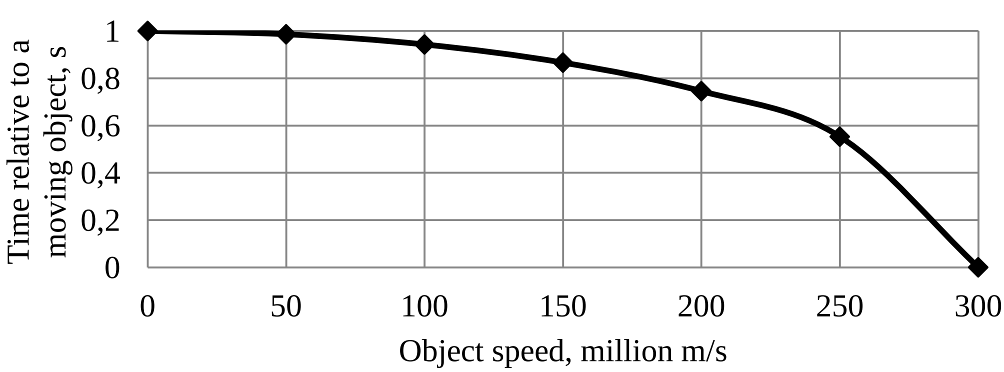

Fig. 1. Time dependence, flowing for an object on its speed in the traditional form

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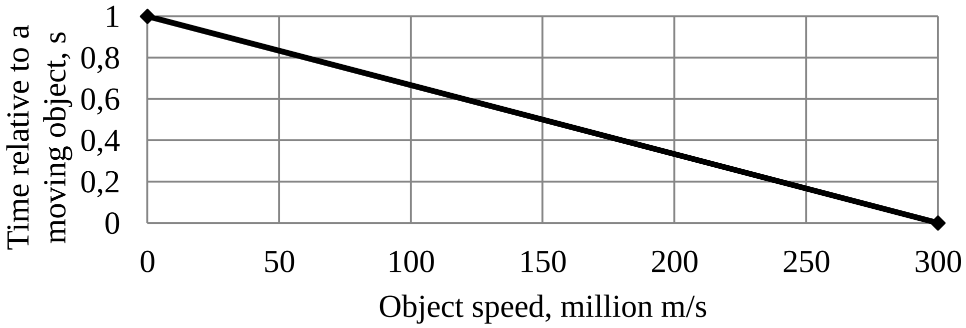

Fig. 2. Time dependence, flowing for an object on its speed in the proposed form

2. The research results and its analysis. Based on the results, the question arises of the nonlinear form of the equation. Having asked a similar question, there were no sufficiently meaningful answers to it. Therefore, another option was considered. Based on the facts that when the object speed is 0 m/s for it and the observer, the time flows equally, and that when the object speed is equal to the speed of light, the time of the moving object is completely stopped, a dependence was built (Fig. 2), in which there is a logical justification.

The linear equation derived from the figure is as follows:

$$t' = 1 - \frac{1}{3} \cdot 10^{-8} \cdot u \ . \qquad (2)$$

The derived equation made it possible to make adjustments to equation (1):

$$t' = t - \left(1 - \frac{u}{c}\right) \cdot t \ . \qquad (3)$$

Consider a specific example of the difference in the calculations between the traditional equation and the proposed one. Let the observer stand motionless and look for one second behind a moving object whose speed is 50 million m/s. The time for a moving object according to the traditional equation is 0.986 s, and according to the proposed 0.833 s. At the speed object of 200 million m/s, the time will be 0.745 s and 0.333 s, respectively. Thus, the difference in values can reach incredibly large values – up to 70%, which indicates the need to revise everything that was constructed on Einstein's general relativity theory.

Let us move on to quantum physics [9–12]. Its main equation is the Schrödinger equation [13–15], which has the following form:

$$i\hbar \frac{\partial \Psi}{\partial t} = -\frac{\hbar^2}{2m} \Delta \Psi + U(x, y, z, t)\Psi \ , \qquad (4)$$

where $i=\sqrt{-1}$ – is the imaginary unit; ħ – is the Planck constant, J·s; Ψ – is the wave function characterizing the of an elementary particle state; Δ – is the Laplace operator; U (x, y, z, t) – is the potential energy of an elementary particle; m – is the particle mass.

Next, we will consider the presented formula in the framework of current research.

3. Discussion. Let us return again to the graphs presented in Fig. 1 and 2. Both graphs allow us to see that when the object reaches the speed of light, the time it senses becomes equal to zero, i.e. stops. Thus, photons and other elementary particles lack such a parameter as time. That is, a person can see the same photon in different places at the same time. This conclusion can confirm most of the known experimental and theoretical results of quantum physics.

Moreover, the equation has a fair form and very accurately describes the impossibility of determining the location of an elementary particle at any time. However, you can notice a very interesting feature. If we leave the variable Ψ in equation (4), but exclude any other variable or add any new one, the result will remain the same as the original version. This indicates its impossible use in real calculations.

The equation presented by Einstein (1) cannot be used when the object speed is greater than the speed of light, because it is impossible to extract a negative number from under the root. Since such speeds are theoretically possible (which science has not yet refuted), we again consider the presented equation (3), which allows us to make the necessary calculations. At a theoretical object speed of 350 million m/s, the time relative to a moving object becomes –0.2 s (Fig. 3).

How is negative speed possible? To begin with, an object can achieve a speed greater than the speed of light only under the influence of a strong gravitational effect inherent in black holes [16–17]. Having accelerated to such a speed inside a black hole, an object falls into the past. Thus, the presence of wormholes can be argued. On its other side, having a speed greater than the speed of light, an object "flies out" of a black hole, thereby confirming another theory – the Hawking radiation. And when a black hole ceases to absorb objects in the "future", then it evaporates and disappears in the "past". Black hole evaporation was also put forward by Hawking in his theory, however, it was not accurately represented how any object could leave it. So, an object can travel in the universe in zigzag ways relative to the time scale created by man to understand the world around him.

Next, the possible object speed through the wormhole was determined. The maximum speed in the calculations was $3.91 \cdot 10^{10}$ m/s, which is many times higher than the speed of light. This value will allow us to further determine the remaining parameters of wormholes, black holes, in particular their size and gravity, as well as other missing parameters in modern physics.

4. Conclusion. Thus, in the course of the research, an alternative equation of the general theory of relativity was proposed, which describes the time difference between the two reporting systems (3). The idea was also presented that time for an object at a speed equal to the speed of light completely stops, and the object can be in completely different places at the same time, which a person feels. It was concluded that objects can move at a speed many times greater than the speed of light, provided they fall into black holes. At the same time, the time value becomes negative, which indicates a journey into the past and the existence of wormholes. All the aforementioned conclusions confirm that the laws of physics are still studied very superficially and there are stunning research results ahead of us, the main thing is to move in the right direction.

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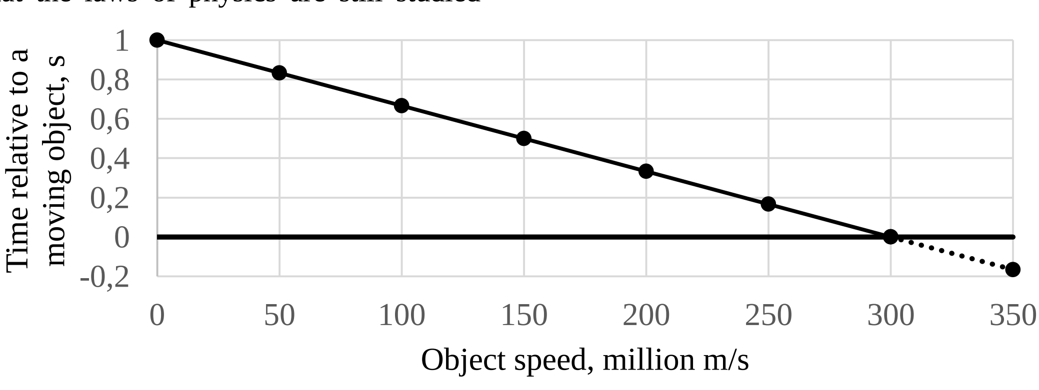

Fig. 3. Time dependence, flowing for an object on its speed in the proposed form

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ОТ ОБЩЕЙ ТЕОРИИ ОТНОСИТЕЛЬНОСТИ ДО КВАНТОВОЙ ФИЗИКИ, ЧЕРНЫХ ДЫР И КРОТОВЫХ НОР

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Рассмотрены проблемы современной физики, в том числе невозможность создания физико-математической теории всего, описывающей сразу все фундаментальные взаимодействия, а именно – гравитационное, электромагнитное, сильное и слабое. Проведен анализ общей теории относительности, в результате которого предложено альтернативное уравнение, описывающее разность во времени между двумя системами отчета. Полученное уравнение имеет логический линейный вид. Также было рассмотрено основное уравнение квантовой физики – уравнение Эрвина Шредингера. Основываясь на общей теории относительности, была предложена теория, согласно которой время для объекта, движущегося со скоростью света, полностью останавливается. Представленное уравнение теории относительности позволяет утверждать, что объект может развивать скорость больше, чем скорость света. Такую скорость объекту позволяет развивать черная дыра, попав в которую время течет вспять, и объект возвращается в прошлое через кротовые норы. Представлена максимальная скорость прохождения объекта через кротовую нору.

Ключевые слова: общая теория относительности, Альберт Эйнштейн, преобразования Галилео Галилея, Хендрик Лоренц, квантовая физика, Эрвин Шредингер, теория всего, черные дыры, кротовые норы, Стивен Хокинг, Вселенная, теория Большого взрыва.