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DARK MATTER, DARK ENERGY AND RELATED TOPICS IN THEORETICAL PHYSICS

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Abstract

The work is devoted to a detailed analysis of the fundamentals of general relativity and related theories and hypotheses. The basic experiments underlying the general theory of relativity are critically analyzed. Consideration also involves modern experiments allegedly confirming this theory. The problems concerning numerous consequences of general relativity, such as the Big Bang theory and relativistic cosmology, are highlighted. Also addressed the problems associated with the concepts of dark matter and dark energy. The recent experiments on the detection of gravitational waves are considered in detail. Critical analysis shows the need to return to the classical concepts of space and time and to build a theory of gravity on this solid basis.

Keywords: general relativity theory; dark matter; dark energy; Big Bang; gravitational waves.

1 Introduction

The general theory of relativity (GTR) and related ideas are traditionally considered advanced science: the big bang hypothesis, relativistic cosmology, studies of so-called dark matter, dark energy, etc. A huge number of papers [2,5-7,11,12,15,18,19,22-24] are devoted to this research, including books, conferences, broadcasts and films.

GTR contains rather original ideas, for example, the equivalence principle, expressed through the idea of geometrization. In the case of correctness of the basis of the general relativity, it could claim the status of a scientific hypothesis about the amendments to the static law of Newton. For the sake of justice, it should be noted that GTR has never been universally recognized as an alternativeless theory. The flow of fair criticism of this theory did not cease from the very beginning of its emergence (see, for example, [1,3,4,9,13,16,17] and references therein).

The main objectives of this paper are as follows:
– the detailed analysis of the initial GTR base;
– the analysis of new confirmations of GTR;
– the analysis of the Big Bang theory and relativistic cosmology;
– the discussion of issues related to dark matter and dark energy research;
– the analysis of recent experiments on the detection of gravitational waves.

2 Some Remarks on the General Theory of Relativity

Let us start with the general theory of relativity (GTR). Many of the difficulties of GTR are well known [1]:

1) the principle of conformity has been violated (without introducing artificial external conditions, there is no limit to the case without gravity);

2) there are no conservation laws;

3) the relativity of accelerations contradicts the experimental facts;

4) there are singular solutions.

Usually, any theory is considered inapplicable in such cases, but the theory of relativity to preserve its "universal character" begins to build fantastic images: black holes, the Big Bang, etc.

The presence of singularities or the multiconnectity of the solution means that at least in these areas the solution is not applicable. Such a situation takes place with a change in the signature of space and time for the "black hole" in Schwarzschild's decision and one should not look here for any artificial

philosophical meaning. The non-observability of "black holes" follows even from GTR: the time of formation of a "black hole" will be infinite for us as remote observers (even if we had waited for the end of the World, no single "black hole" would have time to form). However, since the collapse cannot end, there are no sense to discuss solutions which consider as if everything would be already happened. The separation of events for an internal and external observer by infinite time is not "an extreme example of the relativity of the course of time", but an elementary manifestation of the inconsistency of the Schwarzschild solution. The "incompleteness" of solution systems demonstrates the same fact.

The use of non-inertial systems in GTR is internally contradictory: in a rotating system, sufficiently distant objects will move at a speed greater than the speed of light (according to the special theory of relativity - STR - and GTR, the apparent speed must be less than c). However, there is an experimental fact: a photograph of the sky from the rotating Earth shows that visible solid-state rotation (classical) is observed. The use of a rotating system (for example, the Earth) does not contradict classical physics at any distance of the object from the center, while in GTR the magnitude of the component g_{00} becomes negative, and this is unacceptable in this theory. How to be with observations in terrestrial astronomy?

The concept of time in GTR is also confusing. What is this clock synchronization, if it is possible only along unclosed lines? A change in the moment of the initial time reference during a crawl along a closed path is a clear contradiction of GTR, since at a high synchronization rate one can make many such crawls and get an arbitrary aging or rejuvenation.

Games with the properties of space-time lead to the fact that in GTR the use of variational methods is in doubt: the quantities are not additive, the Lorentz transformations are non-commutative, the integral quantities depend on the path of integration.

Now about the experimental substantiation of GTR [1]. Usually, even if there are hundreds of different data, a theory is not always built - it is easier to put the data into a table. In the case of GTR, we have the "Great Theory of Three and a Half Observations," of which three are fiction. Regarding the deviation of light in the gravitational field from the rectilinear motion, we must say the following. First, as noted by most experimenters, the quantitative confirmation of the effect essentially depends on the faith of a particular

experimenter. More information about what Lord Eddington actually measured can be found in article [8]. Secondly, already from the classical formula $ma=\gamma mMrr3$ it follows that any object, even zero and negative mass, will fall in the gravitational field. Thirdly, with what, in fact, is the effect compared? With absolutely empty space? As early as 1962, a group of Royal Astronomers stated that the deviation of a ray of light near the Sun cannot be considered as confirmation of GTR, since the Sun has an atmosphere extending a great distance. Recall that the phenomenon of refraction has been taken into account for the Earth's atmosphere by astronomers for a very long time. More Lomonosov discovered the deviation of a beam of light in the atmosphere of Venus. For clarification, imagine a glass sphere. Naturally, parallel rays (from distant stars) will deviate in it to the center. Such a system is familiar to all as an optical lens. A similar situation will be for the gas sphere (solar atmosphere). To accurately calculate the deflection of a ray of light in a gravitational field, it is necessary to take into account the presence of the solar atmosphere, density and temperature gradients along the path of the ray, which cause a change in the refractive index of the medium (and curvature of the ray of light). And if at a distance of hundreds of meters near the earth's surface these effects cause a mirage, then ignoring them for a ray from a star passing millions of kilometers near the Sun is pure speculation.

Of course, the displacement of the perihelion of Mercury is a beautiful effect, but whether it is enough only one specimen for "attracting scientific theory"? It would be interesting to check it near solids, so that its value can be unambiguously estimated. The fact is that the Sun is not a solid body, and the movement of Mercury can cause a tidal wave on the Sun, which in turn can affect the displacement of the Mercury perihelion. In any case, it is necessary to know the speed of transmission of gravitational interactions to calculate the effect of the tide from Mercury and other planets on the characteristics of the orbit of Mercury. When calculating the perihelion displacement in GTR (from a strict solution for a single attracting point), it seems that we know the exact masses of astronomical bodies. But in fact, if we use GTR as an amendment to Newton's theory, then the situation is the opposite: the task is apparently to restore the exact masses of the planets, then to substitute them for testing GTR. Imagine that the orbit of the planet is circular. In this case, it is immediately obvious that the rotation period in Newton's theory will already be taken in view of the invisible precession, that is, it is renormalized period.

Therefore, the renormalized masses are already included in Newton's theory. Since the GTR corrections are many times smaller than the perturbing influence of all planets and the influence of non-sphericity, the recovery of exact masses in this complex many-body problem can significantly change the description of the entire motion pattern. It is not taken into consideration anywhere.

Generally speaking, the situation with the description of the perihelion displacement of Mercury is typical for the relativistic behavior. First, it is declared that the effect was predicted, although Einstein compared it with the well-known results of the approximate Laplace calculations obtained long before the creation of GTR. We hope everyone understands the huge difference between "predicting" and "explaining in hindsight." Secondly, precession was in classical physics also: according to the 19th century data, the total value of precession due to the influence of some other planets was calculated as *588″*, and the missing calculated value was only about *43″*, that is, it is a small amendment. (Note that according to some data of the 20th century, the total precession value is indicated by almost an order of magnitude greater, but the value of *43″* is "*taboo*"; however, we will not seek fault on trifles from 1/3 of the "huge experimental base of GTR"). Thirdly, even modern mathematics is not able to perform an exact calculation in the many-body problem. In the classical case, the calculation was carried out as the sum of independent corrections from the influence of individual planets (in pairwise interaction, the Sun and the planets were considered material points). Naturally, in the classical case, the final result (already more than 90 percent of the observed!) can still be improved. It is necessary to take into account the non-sphericity of the Sun (an experimental fact!), the influence of all the planets and small bodies of the Solar System and the fact that the Sun is not a solid object (material point). It has a differential rotation, and its local density in different layers is simply obliged to "track" the influence of other moving planets. On this way of attracting more real specific physical mechanisms, the missing small effect can well be found. But the declaration of relativists is an incomprehensible speculation to the mind! They "find" the effect (and only this small percentage), having considered the movements of only two material points – the Sun and Mercury. Sorry, but how will your GTR correct most of the effect already found from the classics? Are you afraid to count? Then what kind of "brilliant coincidence" are you saying?

Pure fit to your desired! Besides, and the work of the founder of relativism with the "explanation" of the displacement of the perihelion of Mercury [6] contains elementary mathematical errors [14]. He did not notice that the roots of the obtained cubic equation are related by Vieta's formulas, and the resultant effect turns out to be strictly zero.

The Hafele-Keating experiment was announced as confirming GTR. However, this conclusion was obtained on the basis of a small sample. Other researchers who obtained access to the same primary data made the opposite conclusion. At the same time, the Hafele-Keating experiment was interpreted in favor of the dependence of time on gravity (interpretation actually means a change in the generator carrier frequency itself in the gravitational field). However, in this case, it contradicts the interpretation of the Pound-Rebka experience, where it was believed that the generator gives the same frequency at any height (and one of the experiments should be excluded from the piggy bank of the theory of relativity). It would be nice for theoreticians to listen to those whom they called the modest and inconspicuous word "observer" [10] to find out: "what really is." After all, it was these "observers" who participated in the creation of the "primary reference system" (WGS-84, PZ-90, GLONASS, NAVSTAR GPS), contrary to the STR postulates, introduced amendments to the motion of the Earth's surface relative to navigation satellites, etc. There is no time for practice (surveyors, engineers, inventors, experimenters) to listen to "retroactive explanations from theorists." So, satellite TV generators NAVSTAR GPS are tuned at the Earth to a frequency of 10.2299999945 MHz so that in orbit the frequency of the generator rises to 10.23 MHz in strict accordance with the Eötvös effect known before STR. Thus, long-term navigation experiments refute a single experience with "flying airplanes".

In the review [22], some new "successes" in the verification of general relativity are pathetically promoted. Thus, in [18], the principle of mass equivalence is discussed, ostensibly taking into account the gravitational coupling energy (by delaying the laser signal sent from the Earth and reflected from the Moon). This problem is completely contrived and does not depend on the "immense size", since the equality of the masses is already incorporated in the quantitative determination of the magnitude of the gravitational constant (and the energy of the gravitational coupling is local, since the principle of close interaction is proclaimed). Attracting cosmic

scales rather worsens the situation, due to the uncontrollability of many parameters. So, in space there exist a medium and fields that affect the propagation of a signal; even the problem of three material points is not solved exactly, and the number of objects in the Solar System is even greater; the exact mass values of astronomical objects are unknown; all objects are in motion (not inertial) and have complex (non-point) forms; geophysical processes are not taken into account (for example, there is no exact theory of tides, and they manifest themselves not only on water, but also on land surface).

Further, there are a number of doubts on the results of [12,15], using radio interferometers with a super-long base. None of the experiments is direct (but only interpretations). The exact mass of the Sun is unknown. And who can determine the exact distances to the Sun or to the vehicles, if the exact path is unknown (it will not be rectilinear, since it depends on the presence of the solar corona, characteristics of the plasma propagation medium)? How can you determine the accuracy of the path difference for a long base taking into account the uncertainty of all angles, the presence of density and plasma temperature gradients? None of the delay times τ can be controlled (i.e., everything is tied up with faith!). Since the phase delay was not subordinate to GTR, a "group delay" was invented to fit under the results (the statistical analysis followed the same purpose). Many ideas about the processes were of a model nature, but since so many models are introduced, then what is being verified? Similarly, whether not too many parameters "were tested" by **only one** experience [23] with the lunar laser ranging? The value to be checked must also be **only one** (under the condition of all other known parameters). Regarding declarations [24], where primary data are not provided, a number of observations can also be made. The Earth and the Moon are not inertial systems (move in space with acceleration); there is no way to control the distance to the reflectors and the constancy of the speed of light (the properties of the propagation medium change); neither the mass shape of the participating objects, nor geophysical processes are taken into account. By the way, information about the radar observations of Venus, which confirm classical physics (the classical law of velocity addition), can be found in [20,21].

In [2,7], a microwave communication system aboard the Cassini spacecraft is used for "evidence". Despite such a variety of methods, the

disadvantages are the same: the exact distributions of density, temperature, fields in the plasma are unknown; therefore, the exact $\varepsilon\alpha\beta\omega$ is unknown, etc.

Now we mention about the "evidence" with the help of pulsars [5,11,19]. Here it is not clear which of the hypotheses is tested by which of hypothesis: after all, the device of pulsars, their modes and mechanisms, their orbits and the distances to them are just assumptions; the path to them and the properties of the propagation medium are also unknown. There is no exact solution to the N-body problem in any theory, even for 3 material points. In [5], some combinations of parameters (some letters) are used, none of which can be precisely controlled. What is this test (and even more - "proof")?

3 Big Bang and Relativistic Cosmology

Theories of the evolution of the universe will forever remain hypotheses, since none of the assumptions can be verified. GTR ascribes to itself the resolution of a number of paradoxes (gravitational, photometric). Recall that the gravitational paradox consists of the following: for an infinite Universe of uniform density it is impossible to obtain certain values from the Poisson equation for the gravitational acceleration of bodies. However, what relation to reality do purely mathematical uncertainties have with conditions at infinity in a model problem? Recall also the essence of the photometric paradox. For a stationary infinite Universe without taking into account the absorption and transformation of light, the brightness of the sky should be equal to the average brightness of stars (again, many unrealistic assumptions). However, in classical physics, the possibilities of solving such paradoxes have been described (for example, using systems of different orders: Emden spheres, Charlier structures, etc.). Obviously, the Universe is not a blurred medium, and we absolutely do not know its structure as a whole in order to assert the possibility of realizing the conditions for such paradoxes (rather, on the contrary). For example, the Olbers photometric paradox is easy to understand on the basis of the ocean analogy: light is absorbed, scattered and reflected in portions and the light simply stops penetrating to a certain depth. Of course, for a rarefied Universe, such a "depth" is enormous. However, luminous stars are quite compact objects that are far from each other. As a result, only a finite number of stars contribute to the intensity of the light of the night sky (not to mention the fact that in theory it is necessary to take into account the experimental fact - the red shift).

Regarding the redshift in the spectra of astronomical objects, the situation is not fully defined. In the Universe there is a significant proportion of objects in which different parts of the spectrum have completely different displacement. Generally speaking, since the distance to distant objects is not directly determined (the calculated result is tied to certain hypotheses), then connecting it with the red shift is also a hypothesis (in which it is not known what can be tested). It should be noted that elementary scattering will contribute to the redshift and filling of the so-called relict radiation: recall that the Compton effect gives waves with $\lambda > \lambda 0$. The displacement of lines in the gravitational field was perfectly predicted even by mechanistic models from general energy considerations.

Generally speaking, the Big Bang theory raises great doubts. In addition to trivial questions: what exploded, where and when (after all, supposedly there was neither space, nor time, nor matter), the question arises: what about the conclusions of GTR about black holes (the irresistible limit of speed of light)? After all, the Universe was supposed to be a black hole at the initial moment (and not only at this moment). What about the restrictions of GTR: because now instead of such a figurative description of compression in the black hole, ubiquitous expansion is attributed to the Universe? It is interesting, probably, to compose something that cannot be verified.

Let us turn to the next principial issue. Is it a plus that the distribution and movement of matter cannot be given arbitrarily? And is this right? In the general case, this means the inconsistency of the theory, since in addition to gravitational forces, there are other forces capable of moving matter. From a practical point of view, this means that at the initial moment of time we had to specify all the distributions in the "correct for GTR" way. Then whether or not should we attribute $t0$ to the "moment of creation"? And what principles should be uniquely determined for such a choice? Knowledge is required more than any possible expectations from GTR predictions. The possibility of adding a cosmological constant to Einstein's equations is an indirect recognition of the ambiguity of the equations of general relativity and the possibility of arbitrariness.

4 Dark Matter and Dark Energy

Recall that the conclusion about the existence of the so-called "dark matter" was made **only on the basis of indirect signs** of the behavior of

astrophysical objects on the gravitational effects created by them. Contrary to modern theories, these were the following signs: the anomalously high rotational speed of the outer regions of galaxies (which does not decrease as $R^{-1/2}$, but, for example, for the Andromeda nebula remains approximately constant); estimation of the mass of galaxies from the motion of satellites of galaxies and nearby globular clusters; the stellar mass of elliptical galaxies is insufficient to hold the gas; estimation of the mass of galaxy clusters, by gravitational lensing. But maybe the theories and estimates themselves are wrong (these may be deviations from the gravitation law, as well as the presence of a rejected medium - ether)? On the one hand, it is postulated that dark matter does not interact with light, but, on the other hand, because it interacts with matter by the forces of gravity, then, contrary to the postulate, "light is emitted from where there is dark matter."

A study of 400 stars within a radius of up to 13,000 light years from the Sun did not reveal the presence of any kind of "dark matter", i.e. it is useless to look for it near the Earth (but for larger distances - these are not verifiable fantasies). Consequently, there are some problems with modern theories in extrapolation over long distances, or some parameters are incorrectly estimated for distant objects.

Along with real objects, completely mythical (the existence of which remains at the level of faith) objects were suggested as candidates for the role of "dark matter": black holes, quark stars, Q-stars, preon stars, primar black holes, Planck black holes (maximons). Relativistic physicists associate the dark matter with the invented problems of the Big Bang and relativistic cosmology. They offer fantastic particles for this role, invented to rescue some pseudoscientific theories: axions (supposedly solving the "problem" of strong CP-violation in quantum chromodynamics), mythical "supersymmetric" particles such as photino, gravitino, Higgsino, sneutrinos also fabulous topological defects of space-time, invented in the framework of the pseudo-theory of "vacuum phase transitions during the expansion of the Universe" (magnetic monopoles, cosmic strings, domain walls, textures).

If dark matter was initially in thermodynamic equilibrium with particles of the cosmic plasma, then how could the temperature drop so that this interaction would stop? For violation of sustainable equilibrium, very weighty reasons are needed (and effective mechanisms).

Regarding the hidden mass: a contradiction arises if the calculations of celestial mechanics take into account only objects visible in the optical range. However, even with the example of the Solar System, we see that besides the Sun itself (luminous), there are also planets with satellites, asteroids, meteorites, meteors, solar wind, dust, gas, etc. Thus, not all the mass in the process of evolution must concentrate in the stars. There is always a separatrix that separates the transit trajectories from trapped ones, and even for trapped trajectories, only a small fraction of the particles can get to the center, since the main movement in this case is not straight, but circular (elliptical). This means that the astrophysical part of the problem under discussion may be associated with an incorrect assessment of the real mass and its evolution, as well as with distortion of the laws obtained in the laboratory under extrapolation over long distances. The cosmological part of the problem should not be seriously discussed at all, since this is a purely hypothetical area.

We make comments on the so-called Zwicky problem (masses of clusters of galaxies). We see only ray projections onto an infinitely distant sphere. We know exactly neither the distance to objects (and, therefore, their mutual arrangement), nor their relative velocities (even the radial projection of velocity is determined with faith in some hypotheses). We don't know from where, to where and how moved (flew) these objects during billions of years and, for scanty on the cosmic scale observation time (the lifetime of observational astronomy), it is almost impossible to predict the further evolution of these objects. So, the problem is purely hypothetical.

The so-called gravitational lensing is, first of all, ordinary gas lenses (of course, related to the total mass of objects, including the mass of gas). However, density and temperature gradients along the path of the beam also play a big role. Note that the rays falling on the Earth from each such extremely distant object have a **very narrow direction** and pass their specific, almost linear path with the optical path length *sns*. However, rays that have passed through different paths can get to one point. Therefore, there is nothing surprising in obtaining several different clear images. The Lyman-alpha forest is just evidence that a variety of states of matter (in this case, hydrogen gas) can meet on the path of the beam. How at such large distances one can estimate that there is some kind of "new" (dark) matter, and even to check that it does not participate in strong interactions (and also in

electromagnetic ones) – remains a mystery. To confirm such non-participation, one must know all the conditions on the path of the beam and have a strict theory of all the states encountered!

Dark energy is invented only to "explain" the supposedly accelerating expansion of the Universe. The expansion hypothesis itself is complete nonsense, and when it was discovered that more distant objects have a greater redshift and this dependence is non-linear, it was necessary to immediately discard the expansion hypothesis and go to the theory of light redness due to scattering and attenuation of waves. Additionally, one should take into account the energy (gravitational) frequency shift when overcoming the gravitational force from the radiating object (in the direction of the beam from more strongly attracting stars and galaxies to the less attracting Earth). It is also necessary to take into account that the path from the star to the Earth will **not be straight**, but "oscillating" depending on the density and temperature gradients and the presence of gas regions. And the greater the distance to the object, the greater will be the difference between the straight line and the path length of the beam (for example, the increasing difference between the length of the sinusoid and the straight line). This is their pseudo-extension.

No crazy terms like "equation of state for dark energy" need to be invented, since only the term "equation of state of matter" has the right to exist. And it does not make sense at all to sum up the mass of real matter and the fictional (according to erroneous calculations) masses of dark matter and dark energy (?!). But the hidden mass, of course, is always there, it just has to be, because in the visible range we fix only a part of the real matter (substance).

The magnitude of the red shift is proportional to the **optical length of the path** that the light passed. The intensity of the light passing through the medium falls nonlinearly (exponentially from the real path), therefore, the estimates of the expansion of the Universe from the luminosity of supernovae Ia are incorrect.

We also note that the measurement of the microwave radiation of the Universe (the so-called "relic radiation") by the WMAP satellite proved that our Universe is flat, i.e. according to "Occam's razor" it was not worthwhile to invent a new entity – "the curvature of space-time", since Euclidean geometry is quite enough. There is also no need for general relativity and a fictional cosmological constant.

5 Gravitational Waves

We now turn to the discussion of the so-called gravitational waves. Space and time are the categories that humanity uses to describe changing (moving) matter; this is our way of knowing the world, our organization (structure) of thinking. And space-time is a completely non-existent "object", as well as its metric is only a mathematical abstraction in such a made-up pseudo-theory as GTR. On the other hand, gravity can have a field nature and material carriers; in this case, gravitational waves could well exist (having no relation to GTR). However, the speed of their distribution is not known in advance. The fact that they cannot be found for many decades is more likely evidence of their absence (we will discuss their "discovery" made to order by LIGO observatories later).

Note that the rates of convergence of the system of binary stars referred to in this connection cannot be determined for a short observation period (inaccuracies in the determination of all system parameters are too great). Seriously to say that you can fix the convergence of double stars (pulsars) at 2.5 inches per day can only be a false scientist (as if it even happens precisely in accordance with GTR). The timing of pulsars can only indicate heterogeneous processes on the pulsars themselves and in the propagation medium of the signal to the observer. None of these phenomena is in any way controlled and is not described by theory at 100%. Even for our closest star, the Sun, there is no theory that predicts all processes, for example, flares, 100% accurately. Also, the propagation of particles from this flash to the Earth is described very roughly. Why do astrophysicists claim about much more distant objects?! Generally speaking, a periodic change in the distance between the objects is observed everywhere (always, except for purely circular movements), including in the Solar System. And the effect should be more noticeable from the nearest objects. This is the first.

Secondly, the calculations made by Laplace on meticulously observing the motion of the Moon showed that the speed of propagation of gravity exceeds the speed of light by many orders of magnitude, which means that the speed of propagation of gravity waves can also be much more than c.

Third, oscillations caused by non-gravitational forces in the laboratory could have a dipole (rather than quadrupole) character, i.e. the wave energy would be greater, and the attenuation less.

Fourthly, is it really proved that the formula for the energy of the waves $E=\hbar\omega$ (or momentum $\mathbf{p}=\hbar\mathbf{k}$) stops acting for supposedly massless gravity? If not, then one should expect much more noticeable results precisely from rapidly vibrating massive objects in laboratory experiments, than from mythical interactions necessarily with a (mythical) black hole.

Fifth, any changes can be discovered only in relation to something (for example, a standard). However, if the metric itself fluctuated, the dimensions of everything, including measuring instruments, would change. As a result, it would be impossible to fix any relative change (perpendicular experimental patterns of the Michelson type interferometer, which often make false conclusions, draw attention to themselves). Thus, it is impossible in principle to detect oscillations of "space-time itself", but disturbances of a geophysical nature are easily recorded, as practice shows, i.e. GTR has nothing to do with it.

Sixth, seriously speaking about the possibility of fixing a change in the metric $10-21\sim10-23$ times can only notorious false scientists, because there are no values measured by humanity with such precision (any 1st year student would be sent to retake the theory of errors), and no statistics here can help here.

Thus, no space-time oscillations (according to GTR, these are supposedly gravitational waves) can in principle be detected independently of the "detector" device (gravitational antenna, Michelson's laser interferometer, etc.). However, what is detected - this can be explained due to real local changes inside the devices caused by changes in real physical parameters (for example, geophysical or cosmic), but not by the mythical "space-time".

The story of the alleged discovery of gravitational waves and the receipt of the Nobel Prize for the pseudo-discovery in 100 years will be considered a disgrace, worse than the times of Giordano Bruno (as there was no threat to life for those who betrayed the Truth for money and fame). What was measured exactly in this "experiment"?

1. The existence of black holes is a hypothesis;
2. the existence of gravitational waves – a hypothesis;
3. GTR is a hypothesis rather than a theory;
4. the speed of propagation of gravity coincides with the speed of light – a hypothesis;
5. the location of the disturbance source is a hypothesis;

6. distance about 1.3 billion light years away from the "source" – a hypothesis;

7. two black holes merged – hypothesis;

8. these "holes" have the mass of 36 and 29 solar masses - are two hypotheses;

9. the mass of the new "hole" and its rotation parameter are hypotheses;

10. the amount of radiated energy is a hypothesis.

Therefore, what value was not hypothetical (settlement-fitting under the theory), but measured and controlled? None! So which of these many hypotheses could be tested in this pseudo-scientific experiment? None!

It is noteworthy that the almost simultaneous observation (2016) of such perturbation and some electromagnetic signal was interpreted as the coincidence of the speed of a gravitational wave with the speed of light. However, the arrival of gamma radiation for a few seconds after some signal in 2018 is no longer interpreted as the difference in these speeds. Here is a fitting pseudoscience!

6 Conclusion

This work was devoted to a detailed analysis of GTR and related theories and hypotheses. A number of conspicuous doubtful points from the textbooks on general relativity were highlighted, including the basic physical concepts and observations underlying the general theory of relativity. The most modern experiments, allegedly confirming this theory, were critically analyzed. Doubtful moments are underlined both for the methods and for numerous consequences of general relativity, such as the Big Bang theory and relativistic cosmology. In addition, the paper discussed the problems posed by the introduction of such concepts as dark matter and dark energy and the ideas that flow from this. The recent experiments that allegedly revealed the existence of gravitational waves are analyzed in detail.

The ultimate conclusion of the article is the need to return to the classical concepts of space and time and to build a theory of gravity on this solid basis.

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