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Time Travels for People on Earth are Already Possible

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ABSTRACT

The article argues that the version of the special theory of relativity (SRT), which is generally recognised and studied in all physics textbooks, is incorrect. And numerous proofs are given to it. SRT on the one hand and all radio engineering, electrical engineering and computer technology on the other hand mutually refute each other. SRT is also refuted by the existence of resonance and shock oscillations. I.e. if SRT were true, then neither computers, nor mobile phones and smartphones, nor television, nor GPS trackers, nor pianos and other musical instruments should exist, church bells would not ring, nor even tsunamis should not exist and swings on children's playgrounds should not swing after a push from parents. Consequently, to refute SRT it was not necessary to invent some very expensive experiments on Tevatron and Large Hadron Collider. And it was necessary simply to look around and to understand that the generally recognised version of SRT is refuted by numerous all known and therefore irrefutable natural and created by people processes. And, hence, SRT should be corrected. Therefore, the author has created the corrected version of SRT, from which relativistic formulas and new scientific knowledge received after creation of incorrect version of SRT it followed that in the nature there is not only our visible universe, but besides it there are many other mutually invisible universes and antiuniverses. And besides existing in universes of matter, space and time, in antiuniverses there exist antimatter, anti-space and anti-time. And the existence of anti-time makes travelling not only in space but also in time possible. And the article explains how it can be done now.

Keywords: imaginary numbers, special theory of relativity, invisible universes and anti-universes, hidden Multiverse, portals, anomal zones.

INTRODUCTION

The 20th century in physics turned out to be rich in new interesting scientific ideas. But many of them, even called theories, have not yet received experimental confirmation. For example, one of the most prominent and currently studied in all physics textbooks is the special theory of relativity (SRT) [1]-[3], which was nominated 66 times for the Nobel Prize, nevertheless, due to the lack of experimental confirmation, it has not received it.

And from the very beginning, the generally accepted version of SRT was criticised by Oli- ver Heaviside, Nikola Tesla, Nobel Prize winner Albert Abraham Michelson, Nobel Prize winner Wilhelm Frederick Ostwald, Nobel Prize winner Joseph John Thomson, Nobel Prize winner Svante August Arrhenius, Nobel Prize winner Philipp Eduard Anton von Lenard, Nobel Prize winner Alvar Gulstrand, Nobel Prize winner Wilhelm Carl Werner Otto Fritz Wien, Nobel Prize winner Walter Hermann Nernst, Nobel Prize winner Ernest Rutherford, Nobel Prize winner Johannes Stark, Nobel Prize winner Frederick Soddy, Nobel Prize winner Percy Williams

Bridgman, Nobel Prize winner Edwin Mattison Macmillan, Nobel Prize winner Hideki Yukawa, Nobel Prize winner Hannes Olof Jösta Alven and many other distinguished scientists.

And in the XXI century this wrong version of STO was even by the above-mentioned arguments experimentally refuted [4]-[33] in the most indisputable way. However being unable to object, the authors of existing physics textbooks simply ignored these refutations and the incorrect version of SRT still continues to be taught even in the most prestigious universities in all countries.

All modern science is in a similar state. In the 21st century Jean de Climont in his books [34]-[37] writes about 9671 scientists who refuted the currently recognised scientific truths in all sciences. But the trouble is not that one or another infidelity has been discovered in the modern sciences. The author of the concept of 'open society' Sir Karl Raimund Popper, a member of the Royal Society of London, wrote [38]: *"...the struggle of opinions in scientific theories is inevitable and is a necessary condition for the development of science".* From which he made, at first glance paradoxical, but in fact correct conclusion that the most valuable results of scientific research are precisely the refutations of generally recognised theories, because they allow them to develop. And this is inevitable. There is no doubt that all scientific knowledge in a thousand years, much less in a million or a billion years, will be quite different. Therefore, we should not naively assume that we have already learnt everything and hinder the research of colleagues who propose new ideas.

THE VERSION OF THE SPECIAL THEORY OF RELATIVITY TAUGHT IN ALL PHYSICS TEXTBOOKS IS INCORRECT

So, what are the refutations of the generally recognised version of SRT obtained during the last century? They are the following:

- the relativistic formulas obtained in this SRT are incorrect;
- the relativistic formulas received in this SRT are incorrectly explained with use of incorrect principle of non-exceeding of speed of light;
- from relativistic formulas of this SRT wrong conclusions about physical unreality of imaginary numbers and existence in the nature of our only visible universe are made.

And these conclusions are available for experimental verification. Indeed, the relativistic formulae

$$\boldsymbol{m(v) = m_0 \,/\, \sqrt{1 - (\frac{v}{c})]^2}} \tag{1}$$

$$\boldsymbol{\Delta t(v) = \Delta t_0 \sqrt{1 - (\frac{v}{c})^{\,2}}} \tag{2}$$

$$\boldsymbol{l(v) = l_0 \sqrt{1 - (\frac{v}{c})]^2}} \tag{3}$$

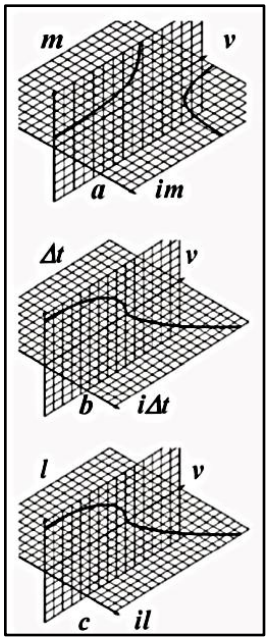

Fig. 1: Graphs of functions $m(v)$, $\Delta t(v)$ and $l(v)$ corresponding to the existing versions of the STR in the subluminal $v < c$ and superluminal $v > c$ ranges

where

- m_0 is the rest mass of a moving body;
- m - relativistic mass of a moving body;
- Δt_0 - rest time of a moving body;
- Δt - relativistic time of a moving body;
- l_0 - rest length of a moving body;
- l - relativistic length of a moving body;
- v is the velocity of the moving body;
- c - speed of light;

are explainable (see Fig. 1a, b, c) only in the range of pre-light velocities *v<c,* in which the values m, and l take values measured by real numbers. And in the range of superluminal velocities ***v>c*** these quantities m, and l already take values measured by imaginary numbers discovered 500 years ago [39], [40], but still unexplained. After all, what is, for example, 10 grams, 20 seconds and 30 metres, everyone can explain, but what is 10***i*** grams, 20***i*** seconds and 30***i*** metres, where $\boldsymbol{i} = \sqrt{-1}$, is not explained in any textbook. Moreover, the graph in Fig. 1a in the range of velocities ***v>c*** corresponds to a physically unstable process, which cannot exist in nature at all. And since such a theory, the formulas of which even its creators could not explain, would be of no use to anyone, a postulate called the principle of not exceeding the speed of light was introduced into it. From this postulate it followed that imaginary numbers are physically unreal. Therefore, it was concluded that there was no need to explain them.

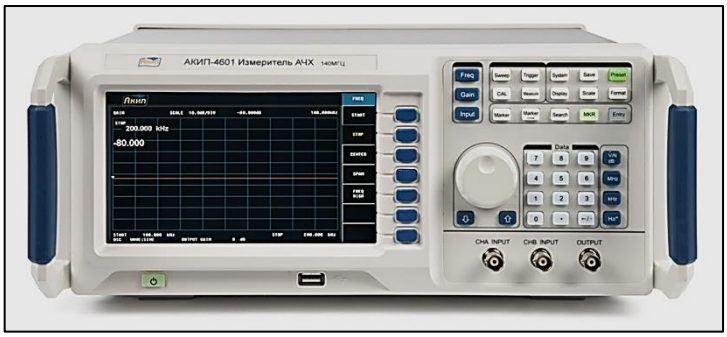

Fig. 2: In any radio engineering laboratory there are devices called frequency characteristic meters, which by their very existence prove the physical reality of imaginary and complex frequencies, and consequently, of any imaginary and complex numbers.

But there are other sciences besides physics. And in the theory of linear electric circuits used in radio engineering, electrical engineering and computer technology, according to Ohm's law as interpreted by Charles Proteus Steinmetz [41], there are imaginary resistances of capacitors and inductors (also called inductance coils), which are measured by devices available in any radio engineering laboratory (Fig. 2). This proves [42]-[53] that imaginary numbers are physically real[1] and the principle of non-exceeding the speed of light is incorrect. And therefore relativistic formulas (1)-(3) are incorrect[2].

CORRECTED VERSION OF THE SPECIAL THEORY OF RELATIVITY

But even from the uncorrected relativistic formulas (1)-(3) follows an important conclusion, which the authors of SRT have overlooked and by their principle of non-exceeding of the speed of light have made this conclusion impossible – the velocity $\boldsymbol{v}$ in these formulas is an additional, besides length, width and height, spatial dimension. Therefore in the corrected version of SRT the corrected relativistic formulas [54[-[61] are received

$$m(q,r,s)=\frac{m_0 i_1^q i_2^r i_3^s}{\sqrt{1-[v/c-(q+r+s)]^2}} \tag{4}$$

$$\Delta t(q,r,s)=\Delta t_0 i_1^q i_2^r i_3^s \sqrt{1-[v/c-(q+r+s)]^2} \tag{5}$$

$$l(q,r,s)=l_0 i_1^q i_2^r i_3^s \sqrt{1-[v/c-(q+r+s)]^2} \tag{6}$$

where $\boldsymbol{q}(\boldsymbol{v})=\lfloor \boldsymbol{v_q}/\boldsymbol{c} \rfloor$ – is the "floor" function of discrete mathematics from the argument $\boldsymbol{v/c}$, which is the fourth spatial dimension (Fig. 3);

[1] Since you can only measure what actually physically exists.

[2] Since the derivation of correct relativistic formulas due to absence in the 20th century of necessa-ry experimental and theoretical knowledge simply was not completed.

- $\boldsymbol{r(v) = \lfloor v_r/c \rfloor}$ – is the "floor" function of discrete maths from the argument $\boldsymbol{v/c}$, being the fifth spatial dimension (Fig. 3);
- $\boldsymbol{s(v) = \lfloor v_s/c \rfloor}$ – is the "floor" function of discrete maths from the argument $\boldsymbol{v/c}$, being the sixth spatial dimension (Fig. 3);
- $\boldsymbol{v_q, v_r\, v_s}$ – projections of the velocity vector v on orthogonal coordinates ***q, r, s*** (see Fig. 4).

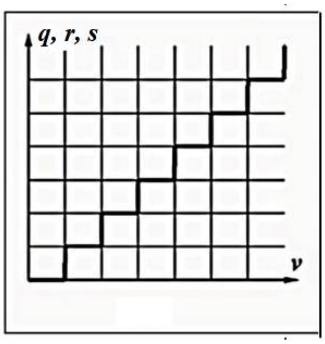

Fig 3: Graphs of functions q(v), r(v), s(v) illustrating the meaning of the "floor" function of discrete mathematics

From them it follows that we live in a Multiverse [62[-[77],which is six-dimensional – three dimensions ***x, y, z*** has each universe and three more dimensions ***q, r. s*** are coordinates of universes in the Multiverse (Fig. 4) – and is described by quaternions $\boldsymbol{f_{q,r,s}(x,y,z) + i_1 q + i_2 r + i_3 s}$, the number of which is equal to the number of universes in the Multiverse. This is exactly what Lisa Randall predicted: *"We could be living in a three-dimensional pocket of higher dimensional space."*

$$i_1^2 = i_2^2 = i_3^2 = -1 \tag{7}$$

$$i_1 i_2 i_3 = i_2 i_3 i_1 = i_3 i_1 i_2 = -1 \tag{8}$$

$$i_1 i_3 i_2 = i_2 i_1 i_3 = i_3 i_2 i_1 = 1 \tag{9}$$

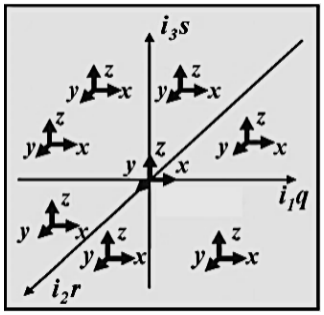

Fig. 4: Six-dimensional space of the hidden Multiverse, where q, r, s are the coordinates of invisible parallel universes, and x, y, z are the coordinates of the matter content in each parallel universe

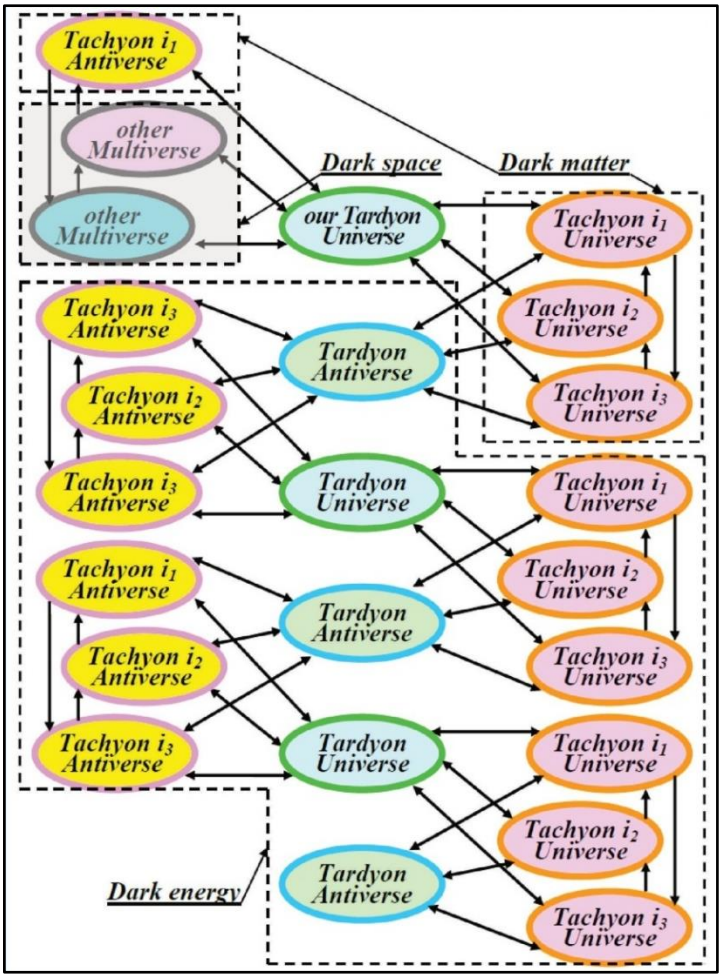

Fig. 5: Possible version of the quaternion structure of the hidden Multiverse

In the mathematics of hypercomplex numbers, the function $i_1^q\, i_2^r\, i_3^s$ can be calculated only for integer values ***q, r, s,*** but can take both positive and negative values, as well as both real and imaginary values. But we have already proven that imaginary numbers are physically real. Therefore, we must also explain them. Therefore, let us now consider the values of the quantities $m(v)$, $\Delta t(v)$ and $l(v)$, and in the range of velocities $\boldsymbol{v > c}$ for successive values of the argument ***q + r + s*** equal to ***0, 1, 2, 3, 4, 5,*** … Then for our visible universe with coordinates ***q = 0, r = 0, s = 0,*** i.e. located at we get $i_1^q\, i_2^r\, i_3^s$ **= –1.** This situation also corresponds to an invisible universe, since it is located beyond the event horizon. We will call it a tardyon[3] antiuniverse. For the value ***q + r + s=3*** in the velocity range $\boldsymbol{v > c}$ we get $i_1^q\, i_2^r\, i_3^s$ = **–** ***i.*** This situation corresponds to an invisible universe, since it is also located beyond the event horizon. We will call it a tachyon[4] antiuniverse. For the value ***q + r + s=4*** in the velocity range $\boldsymbol{v > c}$ we get $i_1^q\, i_2^r\, i_3^s$ = +1. This situation corresponds to an invisible tardyon universe (but a different one), since

[3] The term tardyon-universe was proposed by Isaac Asimov in short story “Take a match”.
[4] The term tachyon-universe was proposed by Isaac Asimov in short story “Take a match”.

it is also located beyond the event horizon. For the value $q + r + s = 5$ in the velocity range $v > c$ we get $i_1^q \; i_2^r \; i_3^s = +i$. This situation corresponds to an invisible tachyon universe (but a different one), since it is also located beyond the event horizon. Thus, all universes are mutually invisible. Therefore, we will call our Multiverse hidden. And to make sure that invisible universes and antiuniverses neighbouring our visible universe exist, one can try to see them [78]-[84] from portals, the entrances to which are probably more than two hundred thousand so-called anomalous zones [85]-[88] existing on Earth. People avoid visiting them - and rightly so – as the portals are invisible labyrinths, once in which it is almost impossible to get out of them. These portals are analogous to a corridor in your flat, from which you can look into the next room and see something in it. And to make sure that you really see something about the neighbouring universe in the portal, you should look at the starry sky through a telescope and see that the constellations on it are at least a little bit different from those outside the portals.

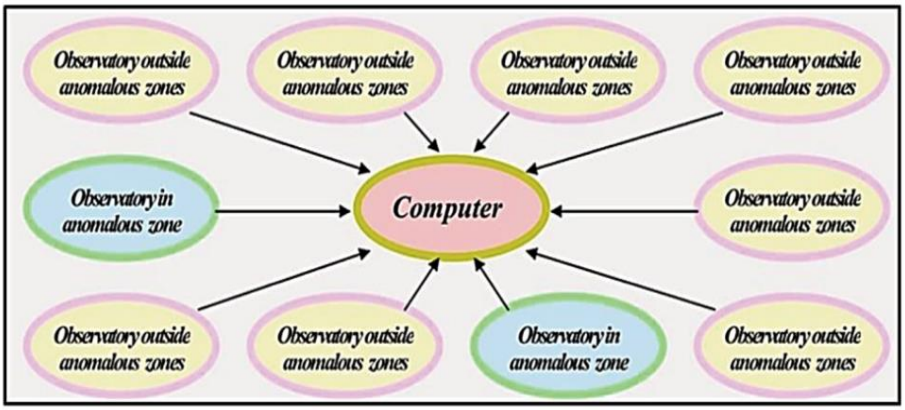

Fig. 6: Scheme of an astronomical experiment to detect invisible universes

In other words, it is necessary to do an experiment similar to the famous experiment of Sir Arthur Stanley Eddington in 1919 [89] by which he confirmed the prediction of the general theory of relativity about the deflection of light rays in the Sun's gravitational field. And we're in luck. Since there are many anomalous zones on Earth, some of them may already host astronomical observatories, through whose telescope one can see these traces of the invisible out-of-portal neighbouring universe or antiuniverse. Such, for example, is the Main Astronomical Observatory of the National Academy of Sciences of Ukraine, which is located in the Goloseevsky forest 12 km from the centre of the capital of Ukraine, Kiev. But since in the anomalous zone, i.e. at the very edge of the portal, the differences of the constellations observed by neighbouring observatories located in anomalous zone and outside the anomalous zone are very small and may be not visible to the naked eye, it is necessary to compare the observations of these observatories on the computer (Fig.6). And if these differences turn out to be too small, the telescope will have to be moved deeper into the portal. After all, Sir Arthur Stanley Eddington moved the telescope much further away – from England to the island of Principe in the Atlantic Ocean in order to perform his famous experiment.

TIME TRAVELS

As is easy to notice, in Fig. 5 half of the universes of the hidden Multiverse are called antiuniverses in order to draw the readers' attention to the fact that they are cosmic antipodes

of other universes. For them, the quantities $m(v)$, $\Delta t(v)$, $l(v)$ in formulas (4)-(6) differ only in sign. That is, the concepts of matter, time and space in the universes correspond to the concepts of antimatter, anti-time and anti-space in the antiuniverses [90]-[93]. But, as on Earth, inhabitants-antipode in space do not notice this difference, since the same physical, chemical, biological and other natural scientific laws operate in the universes and antiuniverses.

And when observed from Earth, in all universes and anti-universes, as they move away from our visible universe, not only the distance increases, but also time (like in time zones on Earth). Moreover, in universes it becomes greater than on Earth, and in anti-universes it becomes less than on Earth. And this circumstance makes time travel really possible both in the past and in the future.

Here are a couple of quotes that explain the current state of understanding of this problem.

> *"Time is the most frequently used word in the English language and the third most frequently used word in Russian. It is in every other language, too, because synchronizing actions in time is just as important as coordinating them in space. Without knowing the exact time, it is impossible to organize your life and plan it in advance. If in ancient times you could rely on natural cycles and an internal sense of time, then in our days you need to constantly have a watch or a phone with you. Time is the most important of the abstract concepts that we pronounce every day. Every thinking person has thought about the problem of time at least once in his life, and a huge amount of philosophical and scientific literature has been written on this topic. Nevertheless, no one can say for sure what time is." [94]*
>
> *Here is what Stephen William Hawking writes about this: "In everyday life, there is a huge difference between moving forward and backward in time. Imagine that a cup of water falls from a table and breaks into pieces. If you film this fall, then when you watch the film, it will immediately become clear whether the film is running forward or backward. If it is running backward, then we will see how the fragments lying on the floor suddenly come together and, having formed a whole cup, jump onto the table. And you will be able to say that the film was running backward, because in everyday life this does not happen. Otherwise, the faience factories would have to be closed" [95].*

This phenomenon, known as the arrow of time, is one of the most amazing problems in physics. And the name "arrow of time" was proposed by the British physicist Sir Arthur Stanley Eddington at the beginning of the 20th century [96]. And all our life experience, it would seem, confirms this opinion.

The corrected version of the STR, in which the new concept of 'anti-time' has appeared, allows this life experience to be corrected. Indeed, if we assume that one day travel through the vastness of the hidden Multiverse will become possible for people on Earth, then time travel [96] will also become possible, both in the past and in the future. Let us show this.

But first, let us explain what we need to learn to do for this. And the main thing we need to learn is to master portals [97], [98], i.e. understand what they are and learn to navigate in them. Just as people once learned to navigate with a compass in the boundless expanses of the seas and oceans. Or even in the forest, in the desert, in the mountains, in any unfamiliar area. Even in labyrinths. So, a portal is an unfamiliar area that has become an invisible labyrinth for people. Portals are transitions from one universe to another, which turn these universes into communicating vessels. Therefore, at the entrance and exit of portals, according to the law of communicating vessels, the habitat should be almost the same – the same air, the same water, the same vegetation and animals[5]. Only the area is unfamiliar. But in order not to get lost in the portals and find the way back, you can use, as in mythology, the 'thread of Ariadne'. Or, in order not to risk ourselves, we can send unmanned vehicles to explore the portals, which people have now learned to make very well. It is also not difficult to create something like a radio compass, taking into account that as you dive into the portals, the electromagnetic field intensity from earthly radio stations should decrease. And on the way back, it should increase. Having got through the portal to some other planet, in order to move further in the hidden Multiverse, you will need to use unmanned aerial vehicles to search for anomalous zones on it, which are entrances to portals that lead to other neighboring universes. And so on. But all these problems are quite solvable.

And now we will show that the concept of the 'arrow of time' in the corrected version of STR is already partially refutable, since although we will not restore the cup mentioned by Hawking, we will be able to move into the past and future time. For this, we will use Fig. 7 and 8. In them, the positive branch of the vertical coordinate axis corresponds to time ***t***, measured in tardyon (including our visible tardyon) universes by positive real numbers, and its negative branch corresponds to negative time ***t*** in tardyon antiuniverses. Similarly, the positive branch of the horizontal coordinate axis corresponds to positive imaginary time[6] ***it***, measured in tachyon universes by positive imaginary numbers, and its negative branch corresponds to negative time it in tachyon antiuniverses. On the vertical axis of real time ***t*** and on the horizontal axis of imaginary time ***it***, thick black arrows show our comparatively long-term activity in tardyon and tachyon universes and anti-universes. And thin красными и синими стрелками показаны red and blue arrows show transitions through portals (staying in which is short-lived) between neighboring universes and antiuniverses.

Then we will consider the simplest options for traveling to the future and the past, since they would be very useful to us. Indeed, traveling to the future would allow us to refuse to continue all types of our unsuccessful activities and make them much more effective. But after such a search for the most effective option for activity, it will be necessary to return to the original state in order to start doing something differently and to do this. Traveling to the past would also be useful if, despite the search for an acceptable option for subsequent activity, it still turned out to be bad. Then it would be necessary, again having returned to the past, to somehow

[5] And if at least one portal on Earth ended in open space, then there would have been no air, no water, no anything else on Earth, like on the Moon or Mars.

[6] Despite the fact that the physical reality of imaginary numbers is denied in the generally accepted version of SRT, the term 'imaginary time' is used in modern physics. For example, in [$$] Hawking writes: "Attempts to unify gravity with quantum mechanics have led to the concept of imaginary time".

correct it. Therefore, having received the opportunity to travel through time, people could make their lives much more successful and happier. And since such searches for happiness are often a rather intimate activity, it would obviously be useful to begin them with the transition from our tardyon universe through the necessary portal to one of the neighboring tachyon universes or antiuniverses, since our activity in them is not visible from our tardyon universe due to the fact that time in them flows in mutually perpendicular directions. And we will have to move to the tachyon universe if we are interested in something in the future. And we will have to move to the tachyon antiuniverse if we need to do something in the past.

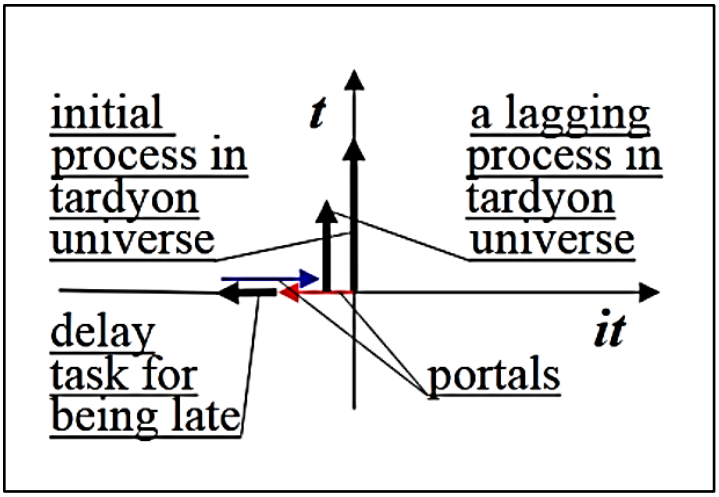

Fig. 7: Possible route of travel to the past time

And Fig. 7 shows one of such simplest routes of travelling to the past time by successive travelling through portals through universes and antiuniverses of the hidden Multiverse. As it can be seen, this journey starts from the origin of coordinates, where in our visible tardyon universe there are conditionally two groups of researchers who spend the same biological time on the same duration of activity. And one of these groups of researchers through the portal (shown by the thin red arrow), moves to the tachyon antiuniverses and stays in it for some time (corresponding to the required lag time on the axis of imaginary time it, shown by the thick black arrow). All this time it is invisible from our tardyon universe, since imaginary time it is perpendicular to real time ***t***. Then it returns to our tardyon universe through the same or another portal (shown by the thin blue arrow) and completes the same work in the same time as the second group of scientists remaining in the tardyon universe. The duration of the activities of both groups in our tardyon universe is shown by thick black arrows of different lengths, which would both have to be on the actual time axis ***t***. But to make the figure more understandable, we have conventionally placed the short thick arrow next to the long thick arrow. And as a result, both groups of researchers, having spent the same amount of time on their identical activity, will nevertheless finish it in our tardyon universe at different times. Thus, the effect of delay was obtained due to the travel into the past time of one group of scientists relative to the other. Naturally, the same result can be obtained using other routes of travel through the Multiverse. Fig. 8 shows another version of the time travel route, which differs from that shown in Fig. 7 in that this travel is carried out into the future. As in the previous case, it begins with the movement of the first group of researchers from the origin of coordinates, but in the opposite direction - through the portal shown by the thin red arrow into

one of the (see Fig. 5) neighboring tachyon universes i_1. Then this group of researchers spends some time, corresponding to a given interval of advance time, in the tachyon universe i_1 and through another portal (shown by the thin blue arrow) moves to the next tachyon universe i_2. in the same dimension *v*. And from it through the third portal (shown by the thin red arrow) moves to the third tachyon universe i_3 in the same dimension ***v***.

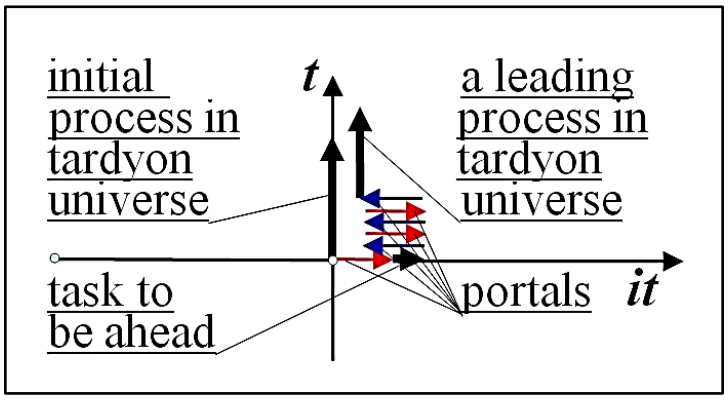

Fig. 8: Possible route of travel to the future time

And finally, from this third tachyon universe i_3. with a triple time advance (obtained due to successive visits to three tachyon universes) returns to our tardyon universe via the portal shown by the thin blue arrow. But with some lead over the second group of researchers, who were in our tardyonta universe all the time. And therefore, when both groups, having spent their equal biological time on their activity, finish it, it will turn out that they finish it at different times. And such a result can be interpreted as follows: the group of researchers who traveled through the hidden Multiverse, was ahead in time of the group of researchers who did not leave our tardyon universe, i.e., they traveled into the future. The same effect, naturally, can be obtained using other time travel routes.

CONCLUSIONS

So, in the article by the analysis of numerous existing in the nature and created by people processes it is experimentally proved and theoretically explained that the version of SRT studied in all textbooks of physics is incorrect, as in it:

- relativistic formulae obtained by its authors are incorrect and incorrectly explained;
- the postulated principle of non-exceeding of the speed of light, used by the authors of this version of SRT because of inability to explain and correct the relativistic formulas received by them, is incorrect;
- the conclusions about physical unreality of imaginary numbers and about existence in the nature of our visible universe, in which everything existing is measured only by real numbers, made from the received by them incorrect relativistic formulas, are incorrect.

Therefore physicists, forced according to the incorrect version of SRT to search for explanations of all physical problems in our only visible universe, could not explain much. They could not explain dark matter and dark energy, they could not discover dark space, they could not solve the problem of baryonic asymmetry and many other problems. For the same reason physicists still cannot explain the physical phenomenon of time and why it is unidirectional. They even

created a special term for this concept 'time arrow'. But they are not sure that this term is irrefutable.

And the article refutes this term. For this purpose the corrected version of SRT was used, in which:

- the physical reality of imaginary numbers is experimentally proven and theoretically explained;
- by the experimentally proved principle of physical reality of imaginary numbers the principle of non-exceeding the speed of light was refuted and thus it was proved that the speed $\boldsymbol{v}$ gives rise to three additional spatial dimensions;
- it was found out that there exists in Nature a six-dimensional Multiverse containing about twenty mutually invisible three-dimensional universes and antiuniverses, whose position in the Multiverse space is determined by three additional dimensions.

It is explained that antimatter in the Multiverse is located in the antiuniverses, which are antipodes of other universes. In the same antiuniverses there are an anti-time, which is opposite to time of other universes. Examples of use of this anti-time are given, allowing already now to move both in the past and in the future time. And the existence of anti-time corrects the understanding of the phenomenon 'arrow of time'.

But anomalous zones in different countries on Earth may have different service advantages and disadvantages. Therefore, different countries may use different portals and different time travelling routes using them. And it will allow to get more valuable information about portals. Astro-geophysical researches of portals [99]-[108] made as a result of such time-travelling in our hidden Multiverse will allow to create time machines imitating on the Earth stay of people in portals. And this, among other things, will significantly increase the effectiveness of scientific research and the corresponding accelerated intellectual and economic development of our entire human civilisation.

ACKNOWLEDGMENTS

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