The essence of the theory of relativity of Albert Einstein

Reiner Georg Ziefle[a)]
Brunnenstrasse 17, 91598 Colmberg, Germany

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Abstract: The epistemological analysis presented in this article shows that the foundations of Albert Einstein's theory of relativity, which he developed in the context of his special theory of relativity, are inconsistent with several experiments. This is not the case with the general theory of relativity, whose predictions coincide with the experiments without contradiction and whose experimental confirmations were celebrated as great scientific achievements. The latter made the physicists obviously blind to the contradictions of the foundations of the theory of relativity and led to an immunization against critical statements on the theory of relativity. As now criticism of relativistic physics is reflexively rejected as unjustified and ignorant by the majority of physicists, a critical discussion of relativistic physics is practically not possible any more. But if this article is not ignored, a paradigm shift in physics will be unstoppable, just as the paradigm shift from the Ptolemaic cosmology to the Copernican cosmology of the 16th century. © *2018 Physics Essays Publication*. [http://dx.doi.org/10.4006/0836-1398-31.3.279]

Résumé: L'analyse épistémologique présentée dans cet article révèle que les bases de la théorie d'Albert Einstein sur la relativité qu'il a élaborée dans le contexte de sa théorie restreinte de la relativité ne sont pas cohérentes avec de nombreuses expérimentations. Cela n'est pas le cas pour la théorie générale de la relativité dont les prédictions coïncident sans contradiction avec les expérimentations et dont les confirmations expérimentales ont été célébrées comme des résultats scientifiques majeurs. Ces derniers ont apparemment occulté aux physiciens les contradictions des bases de la théorie de la relativité et provoqué une immunisation aux déclarations critiques sur la théorie de la relativité. Comme c'est le cas aujourd'hui, les critiques sur la physique relativiste ne sont pratiquement plus possibles. Mais si cet article est pris en considération, une modification du paradigme dans la physique ne pourra plus être stoppée tout comme le changement de paradigme depuis la cosmologie ptolémaïque jusqu'à la cosmologie copernicienne au 16e siècle.

Key words: Paradigm Shift; Gravitational Waves; Hafele–Keating Experiment; Michelson–Gale Experiment; Sagnac Effect; Perihelion Precession of Mercury; Theory of Special Relativity; Theory of General Relativity; Einstein's Theory of Relativity; Four-Dimensional Space Time.

I. INTRODUCTION

Why do we need an epistemological evaluation of so-called relativistic physics? This question can be answered by a quotation of Einstein himself: Science without (sufficient) Epistemology is—in so far as it is thinkable at all—primitive and muddled. The results of the epistemological analysis presented in this article concern primarily Einstein's special theory of relativity because his general theory of relativity, which was developed from the postulations of special relativity, is only secondarily affected. Some equations are sometimes a bit overderived because I want everyone to understand them easily.

II. EARLY TRIUMPHS OF EINSTEIN'S THEORY OF RELATIVITY AND THEIR EPISTEMOLOGICAL EVALUATION

Results of measurements of the velocity of light on Earth, as for example, by Michelson between the years 1848 and 1879 were too imprecise to decide, whether the velocity of light is independent from Earth's rotation around the Sun. In Maxwell's equations of electromagnetism, which were published in 1865, he already used a constant velocity of light given by the constant c. To explain the universality of his formulas, Maxwell proposed in 1877 that light travels through an "ether", which is everywhere in the universe. In 1887 Michelson and Morley performed the so-called Michelson–Morley experiment, which should try to detect the ether wind generated by the movement of the Earth through the postulated ether filling up the universe.[1] Physics theories of the late 19th century assumed that waves must have a supporting substance, some kind of medium, to be able to move through space, so light should also require a medium, the "luminiferous ether." Earth orbits around the Sun at a speed of about 30 km/s. The Michelson interferometer sent yellow light from a sodium flame through a half-silvered mirror used to split it into two beams traveling at right angles to one another. After leaving the splitter the beams traveled out to the ends of long arms of vacuum tubes, where they were reflected back

[a)]reiner.ziefle@gmail.com

into the middle by small mirrors. They then recombined on the far side of the splitter in an eyepiece, producing an interference pattern whose transverse displacement would depend on the relative time it takes light to transit the longitudinal versus the transverse arms. If the Earth traveled through an ether medium, a beam reflecting back and forth parallel to the flow of ether would take longer than a beam reflecting perpendicular to the ether because the time gained from traveling downwind is less than that lost traveling upwind. The velocity of the light beam in the direction of the Earth's motion around the Sun must in this case be $c + v$, whereas v stands for the velocity of the earth against the stationary "ether." The velocity of the light beam moving contrary to the motion of the earth around the Sun against the stationary ether must be c - v and the velocity for the light beam moving perpendicularly thereto should be $(c^2 - v^2)^{1/2}$, see about this in Fig. 1.

In this case, the light beam moving in a limb of the Michelson interferometer in the direction of Earth's movement around the Sun, respectively, contrary to the motion of the Earth around the Sun, should need the time t_1 for the path to and fro

$$\begin{aligned} t_1 &= \frac{D}{c+v} + \frac{D}{c-v} \\ &= \frac{D \times (c-v)}{(c+v) \times (c-v)} + \frac{D \times (c+v)}{(c-v) \times (c+v)} \\ t_1 &= \frac{D \times c + D \times v}{c^2 - v^2} + \frac{D \times c - D \times v}{c^2 - v^2} \\ &= \frac{2D \times c}{c^2 - v^2} = \frac{2D}{c} \times \frac{1}{1 - \frac{v^2}{c^2}} \end{aligned} \tag{1}$$

The light beam moving in a limb of the Michelson interferometer perpendicularly to the Earth's moving motion should need the time t_2

$$\begin{aligned} t_2 &= \frac{D}{\sqrt{c^2 - v^2}} + \frac{D}{\sqrt{c^2 - v^2}} \\ &= \frac{2D}{\sqrt{c^2 - v^2}} = \frac{2D}{c} \times \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}. \end{aligned} \tag{2}$$

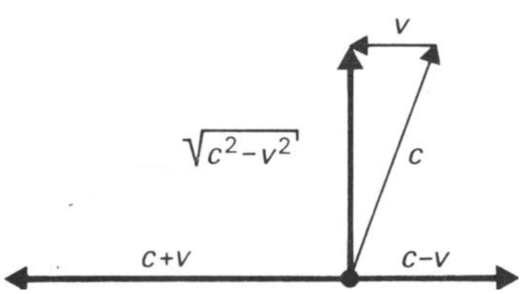

FIG. 1. The velocities of the light beams in the Michelson–Morley interferometer, as it would be seen by an observer resting with respect to the motion of the Earth around the Sun.

For the time difference we get:

$$\Delta t = t_2 - t_1$$

$$\Delta t = \frac{2D}{c}\left(\frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} - \frac{1}{1 - \frac{v^2}{c^2}}\right). \tag{3}$$

Michelson and Morley expected an interference pattern with a fringe shift of about 0.04 fringes, which could not be detected, so that it was postulated that the velocity of light must be constant. The constant velocity of light is explained by the so-called FitzGerald–Lorentz contraction hypothesis, now simply called length contraction or Lorentz contraction. According to relativistic physics, all objects physically contract by the Lorentz factor γ (v) along the line of motion (the meaning of the so-called time dilatation used in the so-called Lorentz transformation is mentioned later)

$$L = \frac{L_0}{\gamma(v)} = L_0\sqrt{1 - \frac{v^2}{c^2}}. \tag{4}$$

The Lorentz factor is defined as

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}. \tag{5}$$

If we put in the time dilatation factor $1/\gamma$ resulting from the Lorentz factor γ for the light beam moving in the direction of Earth's movement around the Sun, respectively, contrary to the motion of the Earth around the Sun, we get for t_1'

$$t_1' = \frac{t_1}{\frac{1}{\gamma}} = \frac{t_1}{\sqrt{1 - \frac{v^2}{c^2}}}. \tag{6}$$

For the time difference we get then, according to relativistic physics

$$\begin{aligned} \Delta t &= t_2 - t_1' = t_2 - \frac{t_1}{\sqrt{1 - \frac{v^2}{c^2}}} \\ &= \frac{2D}{c}\left(\frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} - \frac{1}{\frac{1 - \frac{v^2}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}}}\right) \\ &= \frac{2D}{c}\left(\frac{\sqrt{1 - \frac{v^2}{c^2}}}{1 - \frac{v^2}{c^2}} - \frac{\sqrt{1 - \frac{v^2}{c^2}}}{1 - \frac{v^2}{c^2}}\right) = 0. \end{aligned} \tag{7}$$

All seems to be correct. But if the constants of the velocity of light with respect to any inertial frame shall have any meaning, the constant velocity c must be given for the movement of the light beam in the direction of Earth's motion around the Sun and also for the light beam moving contrary to Earth's motion around the Sun. For a light beam moving in the direction of Earth's motion around the Sun we get for t_1

$$t_1 = \frac{D}{c+v} = \frac{D \times c}{c \times (c+v)} = \frac{D}{c} \times \frac{c}{c+v} = \frac{D}{c} \times \frac{1}{1+\frac{v}{c}}. \quad (8)$$

Reaching Eq. (8), relativistic physicists claim that using the Galilean kinematics in this context is a flaw. The demand that the calculations should already be based on relativistic kinematics at this stage of examination would mean that one already starts from the correctness of what one would like to examine, which would mean an epistemological incorrect circular conclusion. The Lorentz contraction was also developed initially without using relativistic kinematics, see Eqs. (1)–(7). The claim of relativistic physicists to use relativistic kinematics instead of Galilean kinematics at this state of examination must therefore be rejected. The opposite is correct, if a scientist used relativistic kinematics at this state of examination, he would make an epistemological flaw. For the time the light beam moving perpendicularly to the Earth's motion around the Sun, we get for only one way

$$t_2 = \frac{D}{\sqrt{c^2 - v^2}} = \frac{D}{c} \times \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}. \quad (9)$$

For the time difference we get in this case

$$\Delta t_a = t_2 - t_1 = \frac{D}{c} \times \left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}} - \frac{1}{1+\frac{v}{c}} \right). \quad (10)$$

If we put in the time dilatation factor $1/\gamma$ resulting from the Lorentz factor γ, we get

$$\Delta t_a = t_2 - t_1' = \frac{D}{c} \times \left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}} - \frac{\sqrt{1-\frac{v^2}{c^2}}}{1+\frac{v}{c}} \right) \neq 0. \quad (11)$$

For a light beam moving contrary to Earth's motion around the Sun we get the Sun we get for t_1

$$t_1 = \frac{D}{c-v} = \frac{D \times c}{c \times (c-v)} = \frac{D}{c} \times \frac{c}{c-v} = \frac{D}{c} \times \frac{1}{1-\frac{v}{c}}. \quad (12)$$

For the time difference of this light beam and a perpendicularly moving light beam we get in this case

$$\Delta t_b = t_2 - t_1 = \frac{D}{c} \times \left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}} - \frac{1}{1-\frac{v}{c}} \right). \quad (13)$$

If we put the time dilatation factor $1/\gamma$ resulting from the Lorentz factor γ, we get

$$\Delta t_b = t_2 - t_1' = \frac{D}{c} \times \left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}} - \frac{\sqrt{1-\frac{v^2}{c^2}}}{1-\frac{v}{c}} \right) \neq 0. \quad (14)$$

This is already a first contradiction between the postulated phenomena of space contraction and Einstein's theory of relativity. If we want to get a null result comparing the light beam moving in the direction of Earth's motion around the Sun and the perpendicularly moving light beam, we would need a contraction factor, which is different from the relativistic length contraction factor

$$C_F = \frac{1+\frac{v}{c}}{\sqrt{1-\frac{v^2}{c^2}}}. \quad (15)$$

If we put in the time dilatation factor $1/C_F$ resulting from the length contraction factor C_F for the light beam moving in the direction of Earth's movement around the Sun, we get for t_1'

$$t_1' = \frac{t_1}{\frac{1}{C_F}} = t_1 \times C_F = \frac{D}{c} \times \frac{1+\frac{v}{c}}{1+\frac{v}{c} \times \sqrt{1-\frac{v^2}{c^2}}}. \quad (16)$$

If we use the time dilatation factor $1/C_F$ resulting from the length contraction factor C_F, we can get a null result in this case

$$\Delta t_a = t_2 - t_1' = \frac{D}{c} \times \left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}} - \frac{1+\frac{v}{c}}{1+\frac{v}{c} \times \sqrt{1-\frac{v^2}{c^2}}} \right) = 0. \quad (17)$$

If we want to get a null result comparing the light beam moving in the opposite direction than Earth's motion around the Sun and the perpendicularly moving light beam, we would need a length dilatation factor, which is different from the relativistic length contraction factor

$$D_F = \frac{1-\frac{v}{c}}{\sqrt{1-\frac{v^2}{c^2}}}. \quad (18)$$

If we put in the time contraction factor $1/D_F$ resulting from the length dilatation factor D_F for the light beam moving in the opposite direction than Earth's motion around the Sun, we get for t_1'

$$t_1' = \frac{t_1}{\frac{1}{D_F}} = t_1 \times D_F = \frac{D}{c} \times \frac{1-\frac{v}{c}}{1-\frac{v}{c}\times\sqrt{1-\frac{v^2}{c^2}}}. \tag{19}$$

If we use the time contraction factor $1/D_F$ resulting from the length dilatation factor D_F, we can get a null result in this case

$$\Delta t_b = t_2 - t_1' = \frac{D}{c}\times\left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}} - \frac{\left(1-\frac{v}{c}\right)}{\left(1-\frac{v}{c}\right)\times\sqrt{1-\frac{v^2}{c^2}}}\right) = 0. \tag{20}$$

If we calculate the mean value of the length contraction and length dilatation, which are both necessary to get a null result at the Michelson–Morley experiment, if we consider only one-way conditions, we get the Lorentz factor γ

$$\frac{C_F + D_F}{2} = \frac{\frac{1+\frac{v}{c}}{\sqrt{1-\frac{v^2}{c^2}}} + \frac{1-\frac{v}{c}}{\sqrt{1-\frac{v^2}{c^2}}}}{2} = \frac{2}{2\times\sqrt{1-\frac{v^2}{c^2}}} = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}} = \gamma. \tag{21}$$

A mean value might differ in its absolute value, if you use Lorentz transformation instead of Galilean transformation, but nevertheless it will remain a mean value. If we analyze the Michelson–Morley experiment without any theoretical prejudice, only four epistemological conclusions are permissible resulting from the Michelson–Morley experiment:

1. The motion of the Earth around the Sun does not influence the velocity of an electromagnetic wave on Earth.
2. There is no medium or ether needed for the propagation of light, which rests against the motion of the Earth around the Sun.
3. The velocity of light measured in a vacuum on Earth is "constant" and given by c.
4. The Lorentz factor or the relativistic length contraction can only explain the null result of the Michelson–Morley experiment for a light beam that is able to move in the direction of Earth's motion around the Sun and in the opposite direction at the same time. But this does not correspond with a realistic behavior of light beams, which either move toward an observer or away from him, but not both at the same time.

Any further conclusion already uses an overinterpretation that might be wrong, as for example:

1. That light has a constant velocity c on Earth does not justify the assumption that the velocity of light is invariant against any inertial frame (nonaccelerating frames of reference), which is not identical with the inertial frame of the light source.
2. The assumption that the natural laws should be the same everywhere in the universe does not justify the assumption that the velocity of light must be invariant against any inertial frame.

The epistemological analysis of the Michelson–Morley experiment shows that the theoretical and experimental fundamentals of relativistic physics are insufficiently justified. If the fundamental postulation of relativistic physics that the velocity of light is constant within and against any inertial frame is real, the relativistic factor of length contraction γ and the relativistic time dilation factor $1/\gamma$ of Einstein's theory of relativity only represent the mean values the so-called space contraction and time dilatation. The latter is discussed in detail in Section X below. If the invariance of the velocity of light is real, an advanced relativistic physics must realize that there exist infinite different length contractions and time dilatations, as well as infinite different length dilatations and time contractions, depending on which light beams are analyzed and at what angle the light beams move with respect to each other. Till now in literature no length dilatation and no time contraction are described or discussed. But as I pointed out, we need the phenomenon of length dilatation (and also time contraction) to get a null result of the Michelson–Morley experiment for each inertial frame. Going out from the imagination of a constant velocity of light with respect to any inertial frame, as pointed out above, the so-called Lorentz contraction is not real, but is a theoretical composition of a length contraction in the direction of the movement of a body and a length dilatation in the opposite direction. In a Michelson–Morley interferometer using, for example, 4 km long tubes, we get for the tube aligned in motion of the Earth in comparison to the vertically aligned tube (if the light beam moves in the direction of the movement of the Earth) for a resting observer

$$L = \frac{L_0}{C_F} = L_0 \times \frac{\sqrt{1-\frac{v^2}{c^2}}}{1+\frac{v}{c}} \approx 0.9999 \times 4000m \approx 3999.6m. \tag{22}$$

In a Michelson–Morley interferometer using 4 km long tubes, we get for the length of the tube aligned in motion of the Earth in comparison to the vertically aligned tube (if the light beam moves in the opposite direction) for a resting observer

$$L = \frac{L_0}{D_F} = L_0 \times \frac{\sqrt{1-\frac{v^2}{c^2}}}{1-\frac{v}{c}} \approx 1.0001 \times 4000m \approx 4000.4m. \tag{23}$$

For the mean value for the length we get of course again the same value, if we used the Lorentz factor

$$L=\frac{2\times L_0}{\frac{C_F+D_F}{2}}\times=\frac{\dfrac{2\times L_0}{\dfrac{1+\frac{v}{c}}{\sqrt{1-\frac{v^2}{c^2}}}+\dfrac{1-\frac{v}{c}}{\sqrt{1-\frac{v^2}{c^2}}}}}{2}=\frac{\dfrac{2\times L_0}{\dfrac{1}{\sqrt{1-\frac{v^2}{c^2}}}}}{2}$$
$$=L_0\times\sqrt{1-\frac{v^2}{c^2}}=L_0\times\gamma\approx 3999.99996m. \quad (24)$$

If the velocity of c is constant with respect to any inertial frame, the resting observer must be able to see, how the tube aligned in the direction of Earth's motion is contracting and dilating, like an accordion. Can this correspond with reality? If we do not compare different light beams moving at different angles, but only analyze one light beam, we also need length contraction and time dilatation, as well as length dilatation and time contraction, if we want do describe the difference between an observer who moves against a light beam, respectively, against a light source and an observer resting against this movement. For a light beam moving straight toward an observer, while this observer moves toward the light beam, we need for the observer resting against the movement of the moving observer a length contraction factor C_F to get a constant velocity of light for the resting observer. If we do not compare this light beam with a perpendicular moving other light beam (as it does not exist a law or rule which forces us to do that) we get in this case for C_F in this case

$$C_F=\frac{1+\frac{v}{c}}{1}=1+\frac{v}{c}. \quad (25)$$

For a light beam moving straight toward an observer, while this observer moves away from the light beam, we need for the observer resting against the movement of the moving observer a length dilatation factor D_F to get a constant velocity of light for the resting observer. As we do not compare this light beam with a perpendicular moving other light beam, we get for D_F in this case only

$$D_F=\frac{1-\frac{v}{c}}{1}=1-\frac{v}{c}. \quad (26)$$

III. THE LORENTZ CONTRACTION EXPLAINS IMPRECISELY THE NULL RESULT OF THE MICHELSON–MORLEY EXPERIMENT (AS USING ONLY A MEDIUM VALUE), BUT IS NEVERTHELESS INCONSISTENT WITH THE POSTULATION OF RELATIVISTIC PHYSICS THAT THE VELOCITY OF LIGHT IS CONSTANT AGAINST ANY INERTIAL FRAME

The Lorentz contraction is a quite complicated construction of special relativity. In "Spacetime Physics" Taylor and Wheeler work out, how a rocket-attached meter stick could be measured by a lab observer, to get the correct length of the meter stick, as it is predicted by relativistic physics.[2] Taylor and Wheeler hereby use the construction of the Lorentz contraction, as it was derived from the Michelson–Morley experiment and they also considered the time-dilatation postulated by Einstein, see Fig. 2.

For the measurement of the meter stick at each end of the stick a light beam shall be emitted simultaneously. They write: "When the meter stick points along the x axis (direction of motion) the meter stick in the rocket frame is $\Delta x' = 1$ meter, the length in the laboratory frame must be less than one meter"

$$\Delta x=\frac{\Delta x'}{1/\gamma}= \quad or \quad \Delta x=\frac{\Delta x'}{\cos\theta}. \quad (27)$$

By the Lorentz transformation the separations in the laboratory frame are connected with the rocked frame by the equations:

$$\begin{aligned}\Delta x' &= \Delta x\cos\theta-\Delta t\sin\theta\\ \Delta t' &= -\Delta x\sin\theta+\Delta t\cos\theta\\ \Delta y' &= \Delta y\\ \Delta z' &= \Delta z\end{aligned}. \quad (28)$$

According to relativistic physics, distances perpendicular to the direction of motion do not change, so that also in relativistic physics Δy' has still the same length as Δy. We want to examine, what this means for the interpretation of the Michelson–Morley experiment. First, I want to calculate the time the perpendicularly moving light beam in the Michelson–Morley experiment needs, as it is observed by an observer on the Earth

$$t_x=\frac{2L_0}{c}. \quad (29)$$

For the light beam moving to and fro in the limb, which moves in the direction of the Earth around the Sun, the observer on the Earth gets for the time the light beam needs

$$t_y=\frac{2L_0}{c}. \quad (30)$$

An observer on Earth moving with the Earth around the Sun will not register an interference pattern because

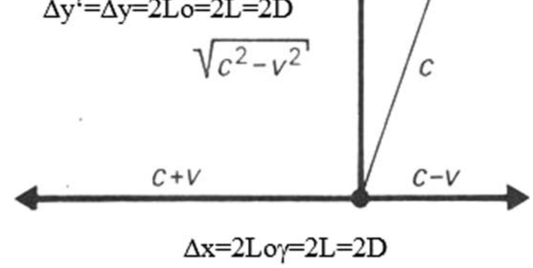

FIG. 2. The Michelson–Morley experiment explained by the so-called Lorentz-Contraction contradicts the postulation of a constant velocity c of light with respect to any inertial system ($1/\gamma = \cos\theta$).

$$t_x = t_y. \tag{31}$$

For the light beam moving to and fro in the limb, which moves in the direction of the Earth around the Sun, using Lorentz contraction the observer resting against the movement of the Earth around the Sun gets for the time the light beam in the Michelson–Morley interferometer needs (Earth is now corresponding with the rocket frame in the example above)

$$t'_x = \frac{2L_0 \times \sqrt{1 - \frac{v^2}{c^2}}}{\sqrt{v^2 - c^2}} = \frac{2L}{\sqrt{v^2 - c^2}}. \tag{32}$$

For an observer, which rests against the movement of the Earth around the Sun, we get for the time the perpendicularly moving light beam in the Michelson–Morley experiment needs

$$t'_y = \frac{2L_0}{\sqrt{v^2 - c^2}} = \frac{2L}{\sqrt{v^2 - c^2}}. \tag{33}$$

An observer resting against the movement of the Earth around the Sun will in this case also not register an interference pattern because

$$t'_x = t'_y. \tag{34}$$

This means that in this case the null result of the Michelson–Morley experiment is invariant and for any observer equal. Therefore, also the experiment of Tomaschek in 1924, who used light from stars for a similar experiment, cannot provide new insights.[3] Going from the relativistic imagination of a constant velocity of light, which orients on inertial fames, the Lorentz contraction is essential for the observer resting against the movement of the Michelson–Morley interferometer around the Sun to be able to observe the null result of the Michelson–Morley experiment, as only then t'_x and t'_y can be equal. But there remains the problem that the velocity of the light beams is observed to be lower than c according to this observer, what contradicts the postulation of a constant velocity c for electromagnetic waves. Einstein solved the problem by postulating the so-called relativistic time dilatation, which an observer in a resting inertial frame shall be able to see for a moving inertial frame. In this case the slower velocity in the example above is compensated by a longer time by the factor γ

$$\Delta t' = \Delta t \times \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{\Delta t}{\sqrt{1 - \frac{v^2}{c^2}}}. \tag{35}$$

According to that the velocity of the light beam shall only seemingly be slower for the observer resting against the movement of the Earth around the Sun, but keeps c in reality, if the longer time intervals are used. Einstein's construction avoided the conflict that the velocity of light might be inconstant. According to that, the resting observer using his "proper time" will observe the null result in the Michelson–Morley interferometer later than the observer moving with the Michelson–Morley interferometer around the Sun. All seems to be alright again in the world of relativistic physics and consistent with the postulated constant velocity of light with respect to any inertial frame. But observing a certain velocity represents a very inaccurate determination of the velocity an observer wants to ascertain. Instead we should better measure the velocity the observer resting against the movement of the Earth wants to ascertain. We only want to examine the distance $\Delta y'$, respectively, Δy, see Fig. 2 again. The observer resting against the movement of the Earth will of course use his atomic clock showing his proper time t_y, while the distances Δy and $\Delta y'$ are identical

$$v'_y = \frac{\Delta y'}{t_y} = \sqrt{v^2 - c^2}. \tag{36}$$

This velocity of the light beam is not identical with the velocity c, which is the basis of relativistic physics. But now Einstein claims that the resting observer is not allowed to use his atomic clock "ticking" in his proper time to measure the velocity of the light beam covering the distance $\Delta y'$, respectively, Δy.

According to Einstein and relativistic physics, the resting observer is obliged to use the atomic clock of the observer, who moves with the Earth, but not as his atomic clock is "ticking" in the moving inertial system, but how the moving atomic clock should "tick," if Einstein's theory of relativity was correct. If the observer resting against the movement of the Earth obeys Einstein and uses the longer time intervals Einstein is imagining, he would get

$$\begin{gathered} v'_y = \frac{\Delta y'}{\Delta t'_y} = \frac{\Delta y'}{\frac{\Delta t}{\sqrt{1 - \frac{v^2}{c^2}}}} = \frac{\sqrt{1 - \frac{v^2}{c^2}} \times \Delta y'}{\Delta t} \\ \frac{v'_y}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{\Delta y'}{\Delta t} = \frac{\Delta y}{\Delta t}. \end{gathered} \tag{37}$$

Putting in the former velocity of light v'_y the observer resting against the movement of the Earth measured for the light beam covering the distance $\Delta y'$, respectively, Δy, he will now get

$$\frac{\sqrt{v^2 - c^2}}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{\Delta y'}{\Delta t} = \frac{\Delta y}{\Delta t} = 1 = c. \tag{38}$$

But, is it allowed to forbid a scientist to measure the velocity of a light beam, which covers a certain distance, which also exists in his inertial frame and has the same distance as in the moving inertial frame, by his own atomic clock? Can we force him to use a fictive atomic clock instead, only to get the result relativistic physicists want him to get? From an epistemological point of view, we are not allowed to do that! Einstein's theory of relativity is according to that correct, as long as the observer resting against the movement of the Earth accepts the prohibition of relativistic physics to use his own atomic clock "ticking" in his proper time. But, if he insists in measuring the time with his own atomic clock ticking in his proper time, relativistic physics is disproved. Although the Lorentz contraction is needed to explain the null result of the Michelson–Morley experiment, if we go from the relativistic postulation that all inertial frames of different observers are equal, cannot help in this context.

IV. EXPERIMENTS PROVED THAT THE VELOCITY OF LIGHT ON EARTH CANNOT BE FASTER THAN C, WHAT IS EXPLAINED BY THE SO-CALLED RELATIVISTIC ADDITION OF VELOCITIES. AS IN THE DERIVATION OF THE RELATIVISTIC ADDITION ALSO LORENTZ CONTRACTION IS USED, THERE AGAIN RESULT CONTRADICTIONS

The experiment of Alväger[4] performed 1964 at the CERN Proton Synchrotron in Switzerland were produced free elemental particles (π^0 = neutral Pions), which were moving by almost the velocity of light in the Synchrotron, respectively, against the surface of the Earth (v = 0,99975 c). The neutral pions decayed within a short time and the velocity of the γ ray from the decay of the π^0 particles was measured absolutely by timing over a known distance. The π^0 particles were regarded as a fast-moving radiation source and if Newton's Mechanics should be valid, Alväger expected, that the velocity of the π^0 particles and the γ ray would summate. But the measurements of the velocity of the γ ray showed only a velocity of about c and not, as the physicists expected it according to Newton's Mechanics, almost double the velocity of light. The result of this experiment was seen again as an argument for the second postulate of Special Relativity, that the velocity of electromagnetic radiation is independent from the motion of the radiation source. Also, for the postulate of Special Relativity, that the velocity of light is constant and cannot be a faster than the velocity of light (c). For the explanation of the result of the experiment, relativistic physicists use the so-called relativistic addition of velocities. Due to the previous analysis, there are doubts about the correctness of the theory of relativity. Instead of Einstein's postulation that the velocity of light should be constant and always **c** within inertial frames, is postulate an antithesis: The velocity of light is constant and always c in a vacuum within a predominant gravitational field, so that the γ rays from the decay of the π^0 particles cannot be faster than **c** with respect to the gravitational field the movement of the π^0 particles happens within.

For the explanation of the result of the experiment of Alväger relativistic physicists use the so-called relativistic addition of velocities. The derivation of the relativistic addition of velocities can be read up in literature, but I want nevertheless demonstrate the derivation here, to show the artificial character of Einstein's theory of relativity. The relativistic addition of velocities is derived the following way, whereas u is the velocity of a body in a resting inertial System S, v is the velocity of the moving inertial System S' with respect to S and u' is the velocity of the body within the moving inertial System S'. In the Inertial System S shall rest a scale with the length Δx, which is passed by a flying body. In this case, we distinguish two events. The event when the middle of a body is just passing the front of the scale is E_1 and the event when the middle of a body is just passing the back of the scale is E_2. If the body moves along the scale with a certain length Δx, we get for the time, which has passed between the two events

$$\Delta x = u \times \Delta t. \tag{39}$$

Using Einstein's time dilatation for the difference of the two events E_1 and E_2, we get for the time difference

$$\Delta t_B = \Delta t \times \sqrt{1 - \left(\frac{u}{c}\right)^2}. \tag{40}$$

The scale with a certain length is moving with the velocity v toward the opposite direction. As the length of the scale is shall be shortened by Lorentz contraction (which we recognized to be unreal in Section II), we get for $\Delta x'$

$$\Delta x' = \Delta x \times \sqrt{1 - \left(\frac{u}{c}\right)^2}. \tag{41}$$

The position at which the body is reaching the front of the scale of the resting inertial system, observed from the moving inertial System (E_1), we define as x' = 0 in the moving inertial System S'. After a certain time Δt' the body is reaching the position

$$u' \times \Delta t'. \tag{42}$$

And then the back of the scale is at the position

$$\Delta t' - v \times \Delta t'. \tag{43}$$

That the event E_2 is given, both distances must be equal

$$u' \times \Delta t' = \Delta t' - v \times \Delta t'. \tag{44}$$

Using

$$u' \times \Delta t' = \Delta t' + v \times \Delta t' = \Delta x', \tag{45}$$

we get

$$\Delta t' = \frac{\Delta x'}{u' + v}. \tag{46}$$

Because of Einstein's time dilatation in the resting System S, we get

$$\Delta t_B = \Delta t' \times \sqrt{1 - \left(\frac{u'}{c}\right)^2}. \tag{47}$$

Using Eqs. (39)–(41) and Eqs. (46) and (47) we can go on with the calculations to get the relativistic addition of velocities. Solving Eq. (39) for Δt and putting Δt in Eq. (40), we get:

$$\Delta t_B = \frac{\Delta x}{u} \times \sqrt{1 - \left(\frac{u}{c}\right)^2} \Rightarrow u = \frac{\Delta x}{\Delta t_B} \times \sqrt{1 - \left(\frac{u}{c}\right)^2}. \tag{48}$$

Solving Eq. (41) for Δx am putting Δx in Eq. (48), we get

$$u = \frac{\Delta x' \times \sqrt{1-\left(\frac{u}{c}\right)^2}}{\Delta t_B \times \sqrt{1-\left(\frac{u}{c}\right)^2}}. \tag{49}$$

By putting Eq. (47) in Eq. (49), we get

$$u = \frac{\Delta x' \times \sqrt{1-\left(\frac{u}{c}\right)^2}}{\Delta t_B = \Delta t' \times \sqrt{1-\left(\frac{u'}{c}\right)^2} \times \sqrt{1-\left(\frac{u}{c}\right)^2}}. \tag{50}$$

Replacing in Eq. (50) Δt′ by Eq. (46), we get

$$u = \frac{\Delta x' \times \sqrt{1-\left(\frac{u}{c}\right)^2}}{\frac{\Delta x'}{u' + v} \times \sqrt{1-\left(\frac{u'}{c}\right)^2} \times \sqrt{1-\left(\frac{u}{c}\right)^2}} \Rightarrow$$
$$u = \frac{(u' + v) \times \sqrt{1-\left(\frac{u}{c}\right)^2}}{\sqrt{1-\left(\frac{u'}{c}\right)^2} \times \sqrt{1-\left(\frac{u}{c}\right)^2}}. \tag{51}$$

Squaring this equation

$$u^2 = \left[\frac{(u' + v) \times \sqrt{1-\left(\frac{u}{c}\right)^2}}{\sqrt{1-\left(\frac{u'}{c}\right)^2} \times \sqrt{1-\left(\frac{u}{c}\right)^2}}\right]^2 \tag{52}$$

and transforming it, we get the relativistic addition of velocities

$$u^2 \times \left[1-\left(\frac{u'}{c}\right)^2\right] \times \left[1-\left(\frac{v}{c}\right)^2\right]$$
$$= (u' + v)^2 \times \left[1-\left(\frac{u}{c}\right)^2\right]$$
$$\Rightarrow u^2 \times \left[1-\left(\frac{u'}{c}\right)^2\right] \times \left[1-\left(\frac{v}{c}\right)^2\right]$$
$$= (u' + v)^2 - (u' + v)^2 \times \left(\frac{u}{c}\right)^2 \tag{53}$$

and further we get

$$u^2 \times \left[1-\left(\frac{u'}{c}\right)^2\right] \times \left[1-\left(\frac{v}{c}\right)^2\right]$$
$$= (u' + v)^2 \times \left(\frac{u}{c}\right)^2 = (u' + v)^2$$
$$\Rightarrow \frac{u^2}{c^2} \times \left[\frac{1}{c^2} \times (c^2 - u'^2) \times (c^2 - v^2) + (u' + v^2)\right]$$
$$= (u' + v)^2. \tag{54}$$

This we can transform in

$$\frac{u^2}{c^2} \times \left[c^2 - v^2 - u'^2 + \frac{u'^2 \times v^2}{c^2} + u'^2 + 2u' \times v + v^2\right]$$
$$= (u' + v)^2$$
$$\Rightarrow \frac{u^2}{c^2} \times [c^2 + \frac{u'^2 \times v^2}{c^2} + 2u' \times v] = (u' + v)^2 \tag{55}$$

and in the end, we get the relativistic addition of velocities

$$\frac{u^2}{c^2} \times \left(c + \frac{u' \times v}{c}\right)^2 = (u' + v)^2$$
$$\Rightarrow u^2 \times \left(1 + \frac{u' \times v}{c^2}\right)^2 = (u' + v)^2$$
$$u^2 \times \left(1 + \frac{u' \times v}{c^2}\right)^2 = (u' + v)^2 \tag{56}$$
$$\Rightarrow u^2 = \frac{(u' + v)^2}{\left(\frac{u' \times v}{c^2}\right)^2}.$$

As there can only result positive values, we get:

$$u = \frac{u' + v}{1 + \frac{u' \times v}{c^2}}. \tag{57}$$

This equation defines the so-called relativistic addition of velocities and theoretically all is well again in the world of relativistic physics. The relativistic addition of velocities uses the Lorentz factor, respectively, the Lorentz contraction, but in Section II, I pointed out that the Lorentz contraction is only a theoretical medium value of a possibly real relativistic space contraction and a possibly real space dilatation. Considering this, relativistic physics would be forced to define a relativistic addition of velocities using the space contraction C_F, if S and S′ is moving in the same direction and a relativistic subtraction of velocities using the space dilatation D_F, if S and S′ is moving in opposite directions. The result would be a veritable relativistic monster of construction, which has to be claimed, if physics wants to describe real relativistic phenomena. But using Ockham's razor, which states that simpler theories are better than theories that are more complex, suggests latest at this point of my analysis that Einstein's theory of relativity might theoretically be well founded, but should be replaced by a simpler theory.

V. CAN RELATIVISTIC PHYSICS BE SAVED OR IS IT FALSIFIED BY NATURE?

If the fundamental postulation of relativistic physics that the velocity of light is constant within and against any inertial frame is real, there must be realized infinite different space contractions and space dilatations. In relativistic physics each observer is equal. For an observer resting against the movement of the Earth around the Sun, who observes a light beam that moves in the direction of the Earth, according to relativistic physics, there must result a space or length contraction factor C_F, as described in Section II, so that we get in this case

$$L = \frac{L_0}{C_F} = L_0 \times \frac{1}{\left(1 + \frac{v}{c}\right)} \tag{58}$$

to realize a constant velocity c for the observer resting against the movement of the Earth. For an observer resting against the movement of the Earth around the Sun, who observes a light beam that moves away from of the Earth, according to relativistic physics, there must result a space or length dilatation factor D_F, as described in Section II, so that we get in this case

$$L = \frac{L_0}{D_F} = L_0 \times \frac{1}{\left(1 - \frac{v}{c}\right)} \tag{59}$$

to realize a constant velocity c for the observer resting against the movement of the Earth. Terrell and Penrose made an effort to explain, why the Lorentz contraction cannot be seen.[5,6] They asserted that the moving object appears to be rotated so that the "real" Lorentz contraction could not be seen. According to their considerations, the moving object would even appear elongated to the resting observer, if the Lorentz contraction was not real. The Lorentz contraction shall lead to a correction of the elongation, so that the object is rotated and appears unchanged in the extension on photos or if visually observed. Unfortunately, the Lorentz contraction does not exist as a real entity, unless one postulates that a light beam with a given direction of motion can always move in the opposite direction at the same time. But nature allows us to prove, if relativistic physics corresponds with reality. Only two examples are presented by the author, which falsify relativistic physics: 1. If the velocity of light is constant with respect to any inertial frame, we must postulate length contraction and length dilatation. According to relativistic physics all observers are equal. From an observer of the Earth the Sun moves with the velocity of about 30 km/h in the opposite direction than the Earth moves around the Sun. In the direction of the relative velocity of the Sun for an observer on Earth, there must result a length contraction, so that we get for the radius of the Sun ($r \sim 696\,000$ km) in this case

$$L = \frac{L_0}{C_F} = \frac{696000\ km}{\left(1 + \frac{v}{c}\right)} \approx 695930\ km. \tag{60}$$

In the opposite direction of the relative movement of the Sun, there must result a length dilatation, so that we get for the radius of the Sun ($r \sim 696\,000$ km) in this case

$$L = \frac{L_0}{D_F} = \frac{696000\ km}{\left(1 - \frac{v}{c}\right)} \approx 696070\ km. \tag{61}$$

In the direction of the relative movement of the Sun according to ("advanced") relativistic physics for an observer on Earth, there should result a radius of the Sun, which is about 140 km smaller than the radius in the opposite direction. But precise observation data show, that there does not exist any difference between the two radii.[7] It is difficult to measure the absolute values of the diameters or of the radii of the Sun and the values differ in depending on the method used. But using the same method with a high accuracy the difference of diameters and radii can be measured. The accuracy of the studies could show that the radii at the equator were 10 km larger than the radii at the poles, but the radii were symmetrical. Relativistic physics explains the invisibility of the so-called relativistic length contraction by the so-called Terrell rotation going back on works of Terrell and Penrose, who explained the invisibility by the Lorentz factor.[2,3] But neither the Lorentz factor nor the Lorentz contraction is real. The Lorentz factor is a theoretical construct, composed of a length contraction and a length dilatation that is needed for the explanation of a constant velocity of light, if the velocity of a light beam moving to and fro is compared with a perpendicularly moving light beam. Therefore, the Lorentz factor cannot explain the contradiction between relativistic physics and observation.

The Hercules Globular Cluster has a radial velocity of about 250 km/s with respect to an observer on the Earth. This means that according to (advanced) relativistic physics, there should result a length contraction in the direction of the radial movement of

$$L = \frac{L_0}{C_F} = L_0 \times \frac{1}{\left(1 + \frac{v}{c}\right)} \approx 0.99917 \times L_0. \tag{62}$$

In the opposite direction, there should result a length dilatation of

$$L = \frac{L_0}{D_F} = L_0 \times \frac{1}{\left(1 - \frac{v}{c}\right)} \approx 1.00083 \times L_0. \tag{63}$$

As space contraction and dilatation must be correlated with stellar density, in this case we should be able to observe a difference of stellar density of 0.00166 between the half of the Hercules Cluster in the direction of the movement and the half of the Cluster in the opposite direction. But super-high-resolution images of Hubble Space Telescope (HST) do not show this difference of the stellar density, which we must postulate, if (advanced) relativistic physics should be correlated with reality. The Lorentz factor or Lorentz contraction, which does not exist in reality, cannot explain the contradiction between relativistic physics and observation. Also concerning galaxies or quasars different radii of their spherical or elliptical structures have never been observed. So, it is proved that relativistic physics cannot correspond with reality and must regarded to be falsified by nature.

VI. MISINTERPRETATION OF THE MICHELSON–GALE EXPERIMENT RESULTING IN FURTHER CONTRADICTIONS

The Michelson–Gale experiment[8,9] (1925) is a modified version of the Michelson–Morley experiment. The aim of the experiment was to find out, whether the rotation of the Earth has an effect on the propagation of light on Earth. The

Michelson–Gale experiment was a large ring interferometer, consisting of two long arms and with a circumference of 1.9 km. Like the Michelson–Morley experiment, the Michelson–Gale experiment compared the light from a single source after traveling in two directions. In the ring interferometer of the Michelson–Gale experiment light beams were sent through a rectangular tube system, the two long limbs (612.6 m) in west-east and east-west directions, and two short limbs (339.2 m) in north-south and south-north direction, with mirrors being mounted at the corners, so that the light in the rectangular tube system could "circulate." The latitude of the experimental setup is given as 41° 46 min of north latitude. Light beams were sent once clockwise and once counterclockwise through the tube system and they were analyzed for their interference behavior. He presented the following equation to calculate the time difference expected, using the shift in the interference fringes when the two beams overlap at the detector as a measure of the time difference

$$\Delta fringe = \frac{4A\omega \times \sin\phi}{\lambda c}, \tag{64}$$

where Δ is the displacement in fringes, A is the area in square kilometers, ϕ the latitude (41° 46′), ω is the angular velocity of Earth, λ the effective wavelength used (5.7×10^{-7} m.) Thus, a displacement of 0.2358 (fringe shift) was expected on the measuring device. The displacement measured by Michelson and Gale was on average 0.230. The result proved with sufficient measuring accuracy that the light speed depends on the rotation of the Earth. Relativistic physicists see no contradiction between the result of the Michelson–Gale experiment, which proved an invariant velocity of light and the dependence of the velocity of light from the rotation of the Earth around its axis. They compare the effect seen at the Michelson–Gale experiment with the so-called Sagnac effect. The Sagnac effect manifests itself in a setup called a ring interferometer, if the interferometer rotates. A beam of light is split and the two light beams to follow the same path but in opposite directions. On return to the point of entry the two light beams are allowed to exit the ring interferometer. It can be observed that the relative phases of the two exiting beams shift according to the angular velocity of the device. In other words, when the interferometer is at rest with respect to the Earth, the light travels at a constant speed. However, when the interferometer system rotates, one beam of light will slow with respect to the other beam of light. Calculating the phase shift of the Sagnac effect the following term can be used:

$$\Delta fringe \approx \frac{8\pi}{\lambda c} \times \omega \times A, \tag{65}$$

whereas Δ is the displacement in fringes, A is the area of the loop, c is the speed of light, and λ is the wavelength of light. Relativists argue as following: "Rotation is absolute in special relativity because there is no inertial frame of reference in which the whole device is at rest during the complete process of rotation, thus the light paths of the two rays are different in all of those frames, consequently a positive result must occur." But there is an important difference between the Sagnac effect with an interferometer rotating on the surface of the Earth and the Michelson–Gale interferometer resting on the surface of the Earth, while the Earth is rotating around its axis: In the rotating Sagnac interferometer all possible different velocities caused by the rotation of the Earth around its axis or also by the rotation of Earth around the Sun are neutralized with respect to a possible fringe shift because of the rotation of the experimental device. In the Michelson–Gale interferometer this cannot happen because the interferometer is resting on the surface of the Earth.

If it is true what relativistic physicists asserts—that rotation is absolute and not relative in special relativity—why cannot we observe an effect of the rotation of the Earth around the Sun in the Michelson–Gale experiment? Where did the velocity v (30 km/s) of Earth around the Sun go in the Michelson–Gale experiment? The velocity of Earth around the Sun is (30 km/s: 0.35 km/s) about 85 faster than the velocity of the rotation of the Earth around its axis (at latitude 41° 46')′

The faster velocity of Earth's rotation around the Sun vanishes by a mathematical trick. As the physicists use the angular velocity for the rotation, the velocity of the Earth around its axis is 2π/day, while the angular velocity of the Earth around the Sun is only 2π/365 days, latter velocity is now not 85 times faster, but 365 times slower, so that it has no meaning any more, if inserted in the formula for the phase shift calculated for the Michelson–Gale experiment. But an observer resting against the movement of the Earth around the Sun still measures for the distance the light has to travel in the long limbs of the Michelson–Gale experiment in west-east and east-west directions an approximate 85 times greater distance, if the light beam is moving in the same direction as the Earth and, if the light beam is moving in the opposite direction an approximate 85 times shorter distance than for an observer of the Earth. According to relativistic physics the velocity of light is absolute, if light moves in rotating systems, like in the Michelson–Gale experiment, so that a space contraction or space dilatation cannot happen in this case because there is no inertial frame of reference in which the whole device is at rest during the complete process of rotation. But the longer or shorter distance light has to travel in the long limbs of the Michelson–Gale experiment in west-east and east-west directions, caused by the rotation of the Earth around the Sun, is still observable for an observer resting against the rotation of the Earth around the Sun.

How can he explain the result of the Michelson–Gale experiment without the occurrence of space contraction (or space dilatation), which is not allowed now, as the velocity of light shall be absolute in this case according to relativistic physics? He is left puzzled, but he cannot express this to us. For an observer who rests against the rotation of the Earth around the Sun the result of the Michelson–Gale experiment is contradictory, if he applies Einstein's theory of relativity. As according to Einstein all observers are equal, this is another disprove of the fundamentals of relativistic physics. This means that all further assumptions of special and general relativistic physics based on the invariance of the velocity of light (constant velocity of light against any moving observer) must be incorrect. It is contradictory to postulate that space contraction (and space dilatation) is not allowed for the observer on Earth for the rotation of the Earth around its axis but must still be necessary for the rotation of the Earth around the Sun for an observer resting against the Sun to explain the experimental result of the Michelson–Gale experiment. Either space contraction or space dilation is forbidden for each kind of rotation and every observer or it is allowed for each kind of rotation and every observer. Michelson and Gale wanted to test with their experiment, if there might exist some kind of ether fixed against the movement of the Earth, which flies with the Earth around the Sun.[8,9] If this ether does not rotate with the Earth, the velocity of light should in this case depend on this ether. From this starting point, it is also possible to calculate the phase shift measured by the Michelson–Gale experiment not by using the angular velocity, but by using velocities distances: The counterclockwise light beam first travels through the northern limb (l_N) lying east-west against Earth's rotation (so that the mirror in the corner is moving toward the light beam, so that the distance the light has to travel gets shorter, but as the light beam is drawn by the not rotating Ether in the opposite direction than the rotation, the velocity of light would be faster against the mirror: the positive velocity effect of the rotation gets doubled), then through the western limb (l_W) lying north-south (at an angle against the rotation, so that the mirror in the corner is moving somewhat ahead the light beam), then through the southern limb (l_S) lying east-west with Earth's rotation (so that the mirror in the corner is moving ahead the light beam, what means that the distance gets longer, but as the light beam is drawn by the not rotating ether in the opposite direction than the rotation, the velocity of light would be slower against the mirror: the negative velocity effect of the rotation gets doubled), and at last through the eastern limb (l_E), lying south-north (at an angle with the rotation, so that the mirror in the corner is moving somewhat ahead the light beam), so that we get

$$t_{counterclockwise} = \frac{l_N}{c+2v} + \frac{l_W}{\sqrt{c^2-v^2}} + \frac{l_S}{c-2v} + \frac{l_E}{\sqrt{c^2-v^2}}. \tag{66}$$

The clockwise light beam first travels through the eastern limb (l_O) lying north-south (at an angle against the rotation, so that the mirror in the corner moves somewhat ahead the light beam), then through the southern limb (l_S) lying east-west against the rotation of the Earth (so that the mirror in the corner moves toward the light beam, what means that the distance gets shorter. But as the light beam is drawn by the not rotating ether in the opposite direction than the rotation, the velocity of light would be faster against the mirror and the positive velocity effect of the rotation therefore gets doubled), then through the western limb (l_W) lying south-north (at an angle with the rotation, so that the mirror in the corner moves somewhat ahead the light beam), and at last through the northern limb (l_N), lying west-east with the rotation of the Earth (so that the mirror in the corner moves ahead the light beam, which means that the distance gets longer, but as but as the light beam is drawn by the not rotating ether in the opposite direction than the rotation, which means that the velocity of light would be slower against the mirror and the negative velocity effect of the rotation gets doubled), so that we get

$$t_{clockwise} = \frac{l_E}{\sqrt{c^2-v^2}} + \frac{l_S}{c+2v} + \frac{l_W}{\sqrt{c^2-v^2}} + \frac{l_N}{c-2v}. \tag{67}$$

For the time difference we get

$$\begin{aligned} dt &= t_{counterclockwise} - t_{clockwise} \\ dt &= \left(\frac{l_N}{c+2v} + \frac{l_W}{\sqrt{c^2-v^2}} + \frac{l_S}{c-2v} + \frac{l_E}{\sqrt{c^2-v^2}}\right) \\ &\quad - \left(\frac{l_E}{\sqrt{c^2-v^2}} + \frac{l_S}{c+2v} + \frac{l_W}{\sqrt{c^2-v^2}} + \frac{l_N}{c-2v}\right) \\ dt &= \frac{l_N}{c+2v} + \frac{l_S}{c-2v} - \frac{l_S}{c+2v} - \frac{l_N}{c-2v} \end{aligned} \tag{68}$$

and further by putting in the different velocities for the northern and southern limb

$$\begin{aligned} dt &= \frac{l_N}{c+2v_N} + \frac{l_S}{c-2v_S} - \frac{l_S}{c+2v_S} - \frac{l_N}{c-2v_N} \\ dt &= \frac{l_S}{c-2v_S} - \frac{l_S}{c+2v_S} + \frac{l_N}{c+2v_N} - \frac{l_N}{c-2v_N}. \\ dt &= \frac{2l_S \times 2v_S}{c^2-2v_S^2} - \frac{2l_N \times 2v_N}{c^2-2v_N^2} \end{aligned} \tag{69}$$

Because of

$$\begin{aligned} c^2 &>> v^2 \\ c^2 &>> v^2, \end{aligned} \tag{70}$$

we get with sufficient approximation

$$dt = \frac{2l_S \times 2v_S}{c^2} - \frac{2l_N \times 2v_N}{c^2}. \tag{71}$$

At this point, we have to consider that Earth's rotation velocity is somewhat slower at the northern limb in comparison to the southern limb. The length of the short limbs, which are oriented in the north-south and south-north directions (339.2 m) corresponds with a latitude angle of 0.00305°. Half of this angular value (0.001525) added to the angle of 41.76666666° (the middle position of the interferometer) gives an angle of 41.76819166° for the angle value for the northern long limb. This corresponds with a cosine value (north) of 0.745845917. Half of this angular value (0.001525) subtracted from the angle of 41.76666666°, gives an angle of 41.7651466° for the angle value for the southern long limb. This corresponds to a cosine value (south) of 0.745881375.

Going from the rotation velocity of the Earth around its axis at the equator $v_E = 463.83$ m/s, we get

$$dt = \frac{2l_S \times 2 \times v_E \times 0.745881375}{c^2} - \frac{2l_N \times 2 \times v_E \times 0.745845917}{c^2}$$
$$dt = \frac{1225.2\ \text{m} \times 2 \times 463.83\ \text{m/s} \times 0.745881375}{c^2} - \frac{1225.2\ \text{m} \times 2 \times 463.83\ \text{m/s} \times 0.745845917}{c^2}$$
$$dt = \frac{847745.6666\ \text{m}^2/\text{s}}{9 \times 10^{16}\ \text{m}^2/\text{s}^2} - \frac{847705.3179\ \text{m}^2/\text{s}}{9 \times 10^{16}\ \text{m}^2/\text{s}^2}$$
$$dt = 4.477 \times 10^{-16}\ \text{s}. \tag{72}$$

For the fringe shift we get from

$$\delta = \frac{dt \times c}{\lambda} = \frac{4.477 \times 10^{-16} s \times c}{\lambda}$$
$$\delta = \frac{4.477 \times^{-16} s \times 299792458\ \text{m/s}}{5.7 \times 10^{-7}}. \tag{73}$$
$$\delta = 0.235$$

This is exactly the fringe shift, which was measured by Michelson–Gale in 1925.[8,9] That means that we get the same fringe shift without using the angular velocity used by relativistic physics (to be able to neglect the rotation of the Earth around the Sun), but by using velocities expressed in distances per time. The precondition for the behavior of the velocity of light on Earth is, that the velocity of light is orienting on something that moves with the Earth but does not rotate with the Earth. Only the gravitational field of the Earth moves with the Earth around the Sun but does not rotate with the Earth. From observations of the Sun we know that the magnetic field of the Sun is not rotating. The Sun turns around itself, once in 25 days, 9 h, and 7 min. (The Sun turns at the equator much faster than at the poles.) This causes the magnetic field lines to be twisted and twisted because the magnetic field is not turning with the Sun, until the magnetic lines eventually break through the photosphere. We see that as sunspots. If we postulate for the gravitational field, that it is also caused by quantum particles, what makes sense, the gravitational field moving with the Earth around the Sun, does not rotate with the Earth around its axis. If the velocity of light is orientating on the gravitational field of the Earth, we get exactly the behavior of the velocity of light, as we observe and measure it on Earth, especially also at the Michelson–Gale experiment.

VII. MISINTERPRETATION OF THE SO-CALLED STELLAR ABERRATION

George Gabriel Stokes (1845) had the idea of a (complete) entrainment of some kind of ether within a body and—with the distance decreasing—also outside the body.[10] The remaining problem was the aberration of the light. To prevent these problems, according to Theodor des Coudres and Wilhelm Wien (1898), the ether entrainment should be proportional to the mass or gravity of the body.[11] For large masses like Earth, the entrainment would therefore be complete, which explains the negative results of terrestrial experimental arrangements such as the Michelson–Morley experiment (1887).[1] But here too, the same aberration problems arose as with Stokes' ether theory. The interference experiments of Oliver Lodge showed that ether is not carried by the movement of different masses. Using rotating disks, Lodge observed that there was no effect on the interference pattern between the disks.[12] Later the Hammar experiment (1935) provided even greater accuracy. In this experiment, one arm was surrounded by a lead spout, while the other was free, and the result was negative.[13] The correct interpretation about the behavior of the velocity of light must therefore be different from Stokes' ether theory, as I postulated it already in my former articles: The velocity of light orients with respect to its velocity c on the predominant gravitational field, which is on Earth the gravitational field of the Earth and not the gravitational field of any (smaller) mass on Earth. In my former articles the orientation of the velocity of light on predominant gravitational fields was not an *ad hoc* hypothesis but was based on the principle of energy minimum.[14,15] Instead of the so-called relativistic addition of velocities, as it was derived above, in this case we just need the definition for the velocity of light within a predominant gravitational field

$$v_{pGF} = c. \tag{74}$$

This definition is all we need to explain, why the velocity of a light beam on Earth is always constant and given by the value c. The artificial construction of the so-called relativistic addition of velocities is not necessary any more. In this case every observer, which is also moving within the same predominant gravitational field as a certain light beam (for example, an observer on the surface of the Earth), will observe the same constant velocity c for this light beam, independent from his velocity within the predominant gravitational field. But an observer moving without this predominant field (for example, an observer on the surface of the moon) is allowed to observe a different velocity for the light beam moving in the other predominant gravitational field by considering his own velocity against the other predominant gravitational field.

Does the aberration of light really contradict our postulation? The aberration of light (also referred to as stellar aberration or velocity aberration) is an astronomical phenomenon that causes an apparent motion of celestial objects about their true positions, dependent on the velocity of the observer on Earth. Aberration causes objects to appear to be displaced toward the direction of motion of the observer compared to when the observer is stationary. The change in angle is typically very small of the order of v/c where c is the speed of light and v the velocity of the observer. In the case of "stellar" or "annual" aberration, the apparent position of a star to an observer on Earth varies periodically over the course of a year as the Earth's velocity changes as it revolves around the Sun. Decisive for the observed stellar aberration on Earth is the orbital speed of the earth around the Sun of about 30 km/s, which gives a maximum speed difference of about 60 km/s. As a result, the fixed star sky is in motion from the perspective of the Earth as a whole. It is not possible for the terrestrial observer to decide from a single measurement whether the beam is inclined at it because of an aberration effect, or if the beam is emitted obliquely by a star that rests in the same inertial system as the observer.

Therefore, it is necessary that at a later time, a second measurement be performed, which is compared with the first measurement. The annual variation of the aberration angle thus measured (neglecting minor effects, for example, the aberration due to Earth's rotation around its axis) corresponds with the result of the relativistic aberration formula, which uses for the velocity not the relative velocity between the star and the Earth, but the relative velocity between the inertial system in which the Earth rests during the first measurement, and the inertial system in which it rests during the subsequent measurement in the course of the orbit of the Sun. This means according to relativistic physics that the stellar aberration is purely an effect of the change of the reference frame.

The astronomer orbits (with Earth) around the Sun and furthermore rotates around the axis of Earth. His current rest frame S′ therefore has different velocities relative to the rest frame S of the center of the Solar System at different times. Hence the astronomer observes that the position of the star changes. The formula is derived under the condition that the change of the position of the star and of Earth is negligible in the period of observation. The mean orbital speed of Earth is 29.78 km/s and therefore the annual aberration is

$$\begin{aligned} \frac{v_E}{c} &= \frac{29.78\ \text{km/s}}{c} = 0.00009935 \\ \frac{v_E}{c} &\times \frac{180}{\pi} = 20.5'' \end{aligned} \quad . \tag{75}$$

How must the stellar aberration be interpreted according to our postulation that the velocity of light orients with respect to its velocity c on the predominant gravitational field? In this case the velocity of light emitted by a certain star fist moves within the predominant gravitational field of the star with the velocity of c, later on it will orient on predominant gravitational fields which might lie on its way to Earth. Before we can observe the light coming from the star, the velocity of the electromagnetic wave will orient on the predominant gravitational field of our Sun and only at last, shortly before the observation on Earth on the predominant gravitational field of the Earth. This means that not the velocity of the star against the Earth is relevant for the stellar aberration observed on Earth, but only the change of the velocity of light from the predominant gravitational field of the Sun when entering the predominant gravitational field of the Earth. It is said that relativistic physics is needed to explain the stellar aberration because only then the stellar velocity does not play a role, but only the inertial frame of the Sun, in which the movement of the Earth around the Sun happens, and the rest frame of the Earth. This means according to relativistic physics that the stellar aberration is purely an effect of the change of the reference frame from the inertial frame of the Sun to the inertial frame of the Earth. The same conditions are given by the postulation that the velocity of light orients on the predominant gravitations field, as pointed out above: Relativistic physics is not needed to explain the stellar aberration and the postulation that the velocity of light orients on the predominant gravitational field is no contradiction to any experiment carried out till now. Actually, it is even a contradiction against relativistic physics that for the measurement of the stellar aberration on Earth the velocity of light within the inertial system of the Sun should be the precondition, although we examine the influence of the star's and Earth's motion on the velocity of light. Why should it be necessary to consult a third inertial system (that of the Sun), if we want to examine the relationship between two other inertial systems (of the observed star and the Earth) and how should this be justified by Einstein's theory of relativity? By the way, relativistic physics uses the same fallacy at the Hafele–Keating experiment. Also, here they have to consult a third inertial system (that of the Sun) to get the right values when they calculate the time difference of the clocks on Earth and in the aircraft, see about this in Section IX.

According to relativistic physics we should be able to compare all inertial systems moving against each other, but this is obviously not possible in the case of stellar aberration. If the velocity c of light would be really invariant against any movement of a light source or an observer, there should not result any effect by the movement of Earth around the Sun. If Einstein's fundamental assumption of an invariant velocity c of light within any inertial frame would be true, the stellar aberration of light would not be allowed to be observable. A null effect would be the result in this case, as also postulated by relativistic physics for the Michelson–Morley experiment. The only rational interpretation of the stellar aberration of light can be, that the velocity of light orients on the predominant gravitational field, in our solar system at first on the predominant gravitational field of the Sun, then on the predominant gravitational field of the Earth. This explains why only the rest frame of the Sun and the Earth plays a role in the calculation of the stellar aberration of light, as it is the case in reality. The stellar aberration of light therefore is a proof for the postulation that the velocity c of light is orienting on the predominant gravitational field light moves through, at least till an alternative explanation might be found. Besides, because of the principle of energy minimum, the postulation that the velocity c of light orients on the predominant gravitational field is a necessary postulation, as pointed out in my former articles.[14,15]

VIII. MISINTERPRETATION OF THE TRANSVERSE DOPPLER EFFECT AND THE ALVÄGER EXPERIMENT

To verify time dilatation Einstein suggested 1907 an experiment based on the measurement of the relative frequencies of light perceived as arriving from a light source in motion with respect to the observer.[16] This effect was later called transverse Doppler effect. The Ives–Stilwell experiment[17] in 1941 was the first direct, quantitative confirmation of the "time dilation factor." Such an experiment was initially imagined to be conducted at right angles with respect to the moving source, in order to avoid the influence of the longitudinal Doppler shift. As the transverse Doppler effect is very difficult to measure, eventually, Ives and Stilwell gave up the idea of measuring this effect at right angles. They used rays in longitudinal direction and found a way to separate the much smaller traverse Doppler effect from the much bigger longitudinal Doppler effect. The experiment was performed in 1938 and they found that the Doppler relationship was not that of "classical theory" and verified the postulated effect of the so-called time dilatation, as predicted by Einstein. Similar experiments were performed several times with increased precision, which all verified the result. Together with the Michelson–Morley experiment the Ives–Stilwell experiment is one of the fundamental tests of special relativity theory, which all seem to verify Einstein's postulation of an invariant velocity c of electromagnetic radiation within inertial frames. Another possible interpretation of the experiment of Ives-Stillwell was not thought of: The postulation that the velocity of light is constant and always c in a vacuum within predominant gravitational fields, so that there must also result a transverse Doppler effect, as light emitted right angled from a moving source cannot be faster than c, so that this light beam must slow down its velocity with respect to the moving source, but still keeps c with respect to the predominant gravitational field the movement of the light emitting source takes place.

In the experiment of Alväger[4] performed 1964 at the CERN Proton Synchrotron in Switzerland π^0 particles moving with the velocity of a about c emitted γ rays. The experiment could show that the velocity of the γ rays always had a velocity of about c and not, as the physicists expected it according to Newton's Mechanics, almost double the velocity of light. The result of this experiment was seen again as an argument for Einstein's theory of special relativity, which postulates that the velocity of electromagnetic radiation is independent from the motion of the radiation source. And also for the postulate of Special Relativity, that the velocity of light is constant and cannot be a faster than the velocity of light (c). But the transverse Doppler effect, the result of the Alväger experiment[4] and the so-called time dilatation (see in detail later) can also be derived from the postulation that light orients with its velocity of light on the predominant gravitational field it is moving in, as described in my former articles.[14,15]

IX. MISINTERPRETATION OF THE HAFELE–KEATING EXPERIMENT RESULTING IN ANOTHER FALSIFICATION OF EINSTEIN'S THEORY OF RELATIVITY

By the experiment of Hafele and Keating[18] in 1971, it could be shown that atomic clocks within commercial aircraft are influenced by the velocity of the airplanes against the surface of the Earth. The velocity of the airliners, once moving eastward and once westward, was 800 km/h on the average on their flight over 50 h. One time the airplane flew with the rotation of the Earth toward the east ($v_E = 1667$ km/h $+ 800$ km/h $= 2467$ km/h) and another time the airplane flew against the rotation of the Earth toward the west ($v_W = 1667$ km/h - 800 km/h $= 867$ km/h). If one subtracts the so-called "gravitational effect on time" in dependence from the altitude of the flights, during the flight against the east the atomic clocks went 255 ns slower (-255 ns) than the atomic clocks on the surface of the Earth and during the flight against the west the atomic clocks went 156 ns faster (+156 ns) than the atomic clocks on the surface of the Earth. As the rotation of the Earth does not influence the flight of an airplane one would expect, that the influence of the velocity of the airplanes on the atomic clocks in the airplanes would be the same for the flight toward the east and toward the west, if one uses the imagination of relativistic physics that motion is always relative. But instead of latter imagination to get the correct results, the physicists had to go from the reference point of an observer, who is in a resting position against the rotation of the Earth. This reference point is a very special reference point, what contradicts the idea of relativistic physics. Hafele and Keating moved with the airliners and they could see an influence of the velocity of the aircraft on time measured by the atomic clocks in the airliners. Hafele and Keating where supervising the atomic clocks during the whole flight and they observed the ticking of the atomic clocks during the flight. The atomic clocks should have "ticked" as usual and Hafele and Keating should not have been able to observe any change of time. But both, the researchers on the ground and the researchers in the aircraft, have observed the same time dilatation, while according to Einstein's theory only the researchers on the ground should have been able to observe the time dilatation.

As the values measured matched very well Einstein's theory of relativity, this qualitative difference was ignored. Although the Hafele–Keating experiment is said to prove Einstein's theory of relativity, there result two unsolvable contradictions of Einstein's theory of relativity: 1. According to the imagination of a constant velocity of a light beam with respect to any inertial frame, time should decelerate by the movement of the light clock, if the light clock of the moving inertial frame I′ is observed by an observer in the resting inertial frame I. But the observer moving with the inertial frame I′ must still observe an unchanged movement of the light beam, as the velocity of light is postulated to be constant in any inertial frame. This means that the observer in the moving inertial frame I′ must still observe an unchanged movement of the light beam within its clock and therefore also measure an unchanged time within his moving inertial frame I′, which is called proper time. (In relativity, proper time is the time, as measured by a clock following a certain path through space-time.) The Michelson–Morley experiment and also the Hafele–Keating experiment should have had a negative result, as the proper time Hafele and Keating were observing in the aircraft is not allowed to change because of the constants of the velocity of light in any inertial frame. But Hafele and Keating observed a changed time by their atomic clocks in the flying aircraft, what contradicts Einstein's theory of relativity. If Einstein's theory of relativity was correct, the Hafele–Keating experiment would have had a null result with respect to Earth's rotation. According to Einstein's theory of relativity, the observers on the ground should be able to see a different time on the display of the atomic clocks in the airliners after the flight, but not Hafele and Keating. This means that the display should be able to show two different "times" at the same time. When the observers on the ground looked on the display of the atomic clocks in the airliners after the flight, they were able to see a changed time on the atomic clocks in comparison to the atomic clocks on the ground. When Hafele and Keating looked on the display of the atomic clock in the airliner during and also after the flight, they should not have been able to see a changed time on the atomic clocks in comparison to the atomic clocks on the ground. As Hafele and Keating could observe the same time, as the observers on the ground, there exists a contradiction against Einstein's theory of relativity. According to relativistic physics, physical laws take only the same form in inertial frames, as for example, the velocity c of light within an inertial system. In contrast, in a noninertial reference frame, the invariable laws of physics within inertial frames (also the velocity c of light) vary depending on the acceleration of that frame with respect to an inertial frame. For example, if we centrifuge a body, according to relativistic physics not the acceleration of the mass causes a force, but the acceleration of the inertial frame. A centrifugal effect interpreted this way must postulate that usual physical forces shall in this case only be a fictitious force. A fictitious force, also called a pseudo force, is an apparent force that acts on all masses, whose motion is described using a noninertial frame of reference, such as a rotating reference frame. The force **F** shall hereby not arise from the physical interaction between two objects, but rather from the acceleration of the noninertial reference frame itself. For example, a hammer thrower does not centrifugally accelerate the hammer itself, but the inertial system of the hammer. So, the hammer thrower does not feel the higher weight of the mass by the acceleration of the mass itself, but by the acceleration of the inertial system of the hammer, which simulates the hammer thrower the higher weight of the mass. When the hammer thrower releases the hammer, the hammer moves straight on, so that at this moment the former pseudo force gets immediately transformed in a real force, as now the laws of physics can again be defined with respect to an inertial reference unambiguously and therefore in an invariable way.

Assuming Newton's second law in the form $\mathbf{F} = m\mathbf{a}$, fictitious forces are always proportional to the mass m. While Newton saw real forces in this "pseudo forces," relativistic physics is forced to describe these forces as fictitious or pseudo forces because elsewhere the constant velocity c of light with inertial frames, which is according to relativistic physics interpreted as a physical law, could be judged to be once constant in an inertial system and once inconstant in a rotating frame, what would be a contradiction of the imagination of a constant velocity of light. According to that gravitational force must also be a fictitious force based upon a field model, in which particles distort space time due to their mass. The definition of pseudo forces in the case of gravitation and centrifugal occurrences is needed for the maintenance of the dogma of the constants of the velocity of light because elsewhere the special and general theory of relativity of Einstein would lose their basis. Aside from/in addition to the theoretical construct of a constant velocity of light within inertial frames there cannot be given any other reason, why nature needs pseudo and real forces. Physicists can also not explain how the transformation of both forces in one another is realized by nature. The two different forces cannot be differentiated by their effect, when they, for example, hit something. The only reason why the differentiation must be made between pseudo forces and real forces is that relativistic physicists shall be right with their postulation of a constant velocity of light within inertial frames. The difference between the atomic clocks used in the Hafele–Keating experiment showed an absolute time effect by the motion of the airplanes in dependence of the rotation velocity of the Earth around its axis, as it was also the case at the Michelson–Gale experiment.[8,9] If the Michelson–Morley experiment could be carried out with laser rays moving only in one way, but not to and fro, the result of the experiment would have been able to show a dependency from the rotation of the Earth around its axis. But one-way experiments with laser rays fail because of the impossibility to synchronize all the clocks at the different measure points that are needed for such experiments.

The experiment of Hafele and Keating also showed that atomic clocks go faster at a certain altitude than on the surface of Earth. The existence of this so-called relativistic gravitational effect was taken as an argument for the correctness of Einstein's theory of general relativity, which postulates that the flow of time is influenced by gravitation. But the so-called relativistic gravitational effect can simply be explained by nonrelativistic considerations: If the velocity of light orients on predominant gravitational fields, a light beam must decelerate by a stronger gravitational effect because electromagnetic radiation should lose energy, when the gravitational attraction on the electromagnetic radiation increases. A photon in a certain altitude over the surface of the Earth has a certain amount of potential energy, that is to say, $E = m \times g \times a$, whereas **g** is the gravitational acceleration of the Earth, m is the mass of the photon, and **a** is the altitude. For the difference of energy of a light beam, we have given

$$\Delta E = h \times \Delta f. \tag{76}$$

As h is the Planck constant and f the frequency of the electromagnetic radiation, we get

$$\Delta f = \frac{\Delta E}{h} = \frac{m \times g \times a}{h}. \tag{77}$$

The mass of the photon is also given by

$$m = \frac{E}{c^2} = \frac{h \times f}{c^2}. \tag{78}$$

If we substitute the mass of the photon by latter term, we get

$$\Delta f = \frac{g \times a}{c^2} \times f. \tag{79}$$

Because of the proportionality of the frequency and the velocity of a beam of light, we get

$$\Delta v = \frac{g \times a}{c^2} \times v. \quad (80)$$

We therefore expect that basic physical processes of motion decelerate, as for example, the velocity of electromagnetic radiation, if the gravitational strength increases and vice versa. But this is not allowed according to the imagination of Einstein's theory of relativity because this would mean that the velocity of light is not always **c** with respect to inertial frames. As relativistic physics forbids this simple explanation, we need Einstein's general theory of gravitation. According to Einstein distances get smaller closer to a mass, so that the velocity of light can still be **c**, despite the slower going time. On the contrary distances get larger, farther away from a mass, so that the velocity of light can still be **c**, despite the faster going time. These conclusions led Einstein to his theory of general relativity with a curved four-dimensional space time. In relativistic physics, the four-dimensional space time of the whole universe must be imagined to be filled with infinitely many clocks. Always when there happens an acceleration or movement of an object, clocks go faster or slower, so that the velocity of light can always keep constant because now not the velocity of light changes, as it would be the case going out only from a tree-dimensional space, but the time changes, with which the velocity of light is measured. The same happens, if there emerges a mass in the four-dimensional space time. Always when this happens the clocks go slower nearer to the mass and faster more distant from the mass, so that the velocity of light can always keep constant because now not the velocity of light changes, as it would be the case going out only from a tree-dimensional space, but the time changes, with which the velocity of light is measured. Starting from this imaginations Einstein developed his general theory of relativity, according to that gravitation is no real force any more but is defined also as a fictitious force or pseudo force. With his imaginations Einstein could celebrate his greatest successes, as for example, the deflecting of light at the Sun[19] the perihelion precession of Mercury[20] and the emission of gravitational radiation, so that orbiting stars gradually lose gradually. This has been observed indirectly in a binary star system known as PSR 1913 + 16.[21,22]

X. AN ALTERNATIVE EXPLANATION OF SO-CALLED SPECIAL RELATIVISTIC PHENOMENA BY THE POSTULATION THAT THE VELOCITY C OF LIGHT ORIENTS ON THE PREDOMINANT (QUANTIZED) GRAVITATIONAL FIELD

As I pointed out for the Lorentz factor γ, also the time dilatation factor $1/\gamma$ is only an average value of postulated so-called "relativistic phenomena." We also want to develop our considerations on a system of two light clocks. A light clock consists of a tube with two mirrors in a certain distance to each other, one mirror at the bottom and one mirror at the top of the tube. In a light clock time is measured by sending a beam of light from the bottom mirror to the top mirror, where it is then reflected back to the bottom mirror and so on. Always, when the light beam hits one of the mirrors, the clock ticks. If the light clocks and the observers are in a resting position, the light beams move straight from one mirror to the other mirror and need a certain time to get from one mirror to the other mirror of the light clock. But if the one observer keeps in the resting position against his light clock, while the other observer starts moving with his light clock from the former common resting position, the still resting observer would see the light beam of the moving light clock travel at angles to the mirrors, see about this in Fig. 3.

In the moving light clock, we would therefore expect the light beam to take a longer time to get from the bottom mirror to the top mirror and to get from the top mirror to the bottom mirror. According to the imagination of a constant velocity of a light beam with respect to any inertial system time must decelerate by the movement of the light clock. But going from the assumption that light beams do not orient on observers or inertial systems, but on the dominating gravitational field, we expect that the light beam traveling at angles in the moving light clock only travels with the velocity c in respect of the predominant gravitational field, as it is correctly observed by the resting observer. This means that with respect to the moving light clock the light beam of this clock must decelerate. With other words we have to postulate that by moving in a dominating gravitational field the velocity of basic physical processes must decelerate. The deceleration of physical processes as for example of the velocity of light with respect to the light source by the movement of this light source within a dominating gravitational field we calculate as following, see about this in Fig. 3. While v is the velocity of the moving light clock with respect to the not moving light clock, c is the velocity of the light beam traveling at angles with respect to the predominant gravitational field and v_p is the velocity of basic physical processes within a physical system, which is moving within a predominant gravitational field, as in our example the velocity of a light beam (v_p) traveling in the moving light clock. By the Sentence of Pythagoras we get

$$v_p^2 = c^2 - v^2. \quad (81)$$

Using relative velocities with respect to c (=1), we get

$$v_p^2 = 1 - \left(\frac{v}{c}\right)^2. \quad (82)$$

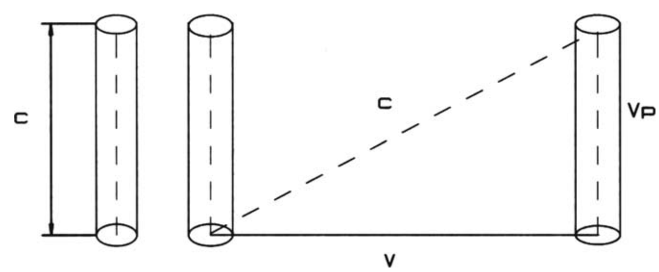

FIG. 3. The relationship in a system of two light clocks, the one resting, the other moving within a gravitational field, if the velocity c of the light beam orients on the predominant gravitational field: A physical process will decelerate (v_p) because the velocity of light cannot be faster than c within the predominant gravitational field.

Transforming this term, we get

$$v_p = \sqrt{1 - \frac{v^2}{c^2}}. \tag{83}$$

The term $1/v_p$ corresponds to the so-called relativistic factor γ used by relativistic physics, which I called the gravitational deceleration factor of motion." By motion within a predominant gravitational field there results a deceleration of basic physical processes, as the velocity of light must decelerate, so that there results also a change of the frequency of a light beam, this is called the relativistic Doppler effect or the traverse Doppler effect in relativistic physics.[17] Velocities can be used to calculate the angle α between the light beam of a light clock (moving within a predominant gravitational field) traveling at angles and the direction of the movement of the light clock

$$\sin\alpha = \frac{1}{\gamma} = \sqrt{1 - \frac{v^2}{c^2}} = v_p. \tag{84}$$

The factor $1/\gamma$ can therefore be used to calculate the angle α directly

$$\alpha = \arcsin\ (1/\gamma) = \arcsin\left(\sqrt{1 - \frac{v^2}{c^2}}\right). \tag{85}$$

But this is valid only for the special situation, when the light clock is orientated vertically with respect to the direction of the movement of the light clock (within a predominant gravitational field). But the light clock could be inclined by variable angles in the moving direction or against the moving direction. Before an inclined light clock is moving, the angle of inclination of the light beam traveling in the light clock is identical with the inclination angle of the light clock, that is to say, some kind of angle α'. If the inclined light clock moves, by the movement the inclination angle of the light beam traveling in the moving light clock changes with respect to the gravitational field, so that this results in a changed inclination angle α of the traveling light beam. Electromagnetic radiation with such a change of the inclination angle by motion is the so-called synchrotron radiation, as can be generated by fast moving electrons in Synchrotons.[23] To calculate the angle α between a light beam, or photon, and the direction of a moving light source resulting in the motion of the light source, for example, a light clock, we have to regard the components of the velocities of the traveling light beam with respect to the x-axis and the y-axis (of the resting coordinate system). The component of the velocity with respect to the x-axis of the light beam in an inclined moving light clock is the product of the vertical component of the velocity of the light beam

$$v_p = \sqrt{1 - \frac{v^2}{c^2}} \tag{86}$$

and sinus of the angle α', so that we get

$$v_x = \sin\alpha' \times \sqrt{1 - \frac{v^2}{c^2}}. \tag{87}$$

The component of the velocity with respect to the y-axis of the light beam in an inclined light clock with the angle α' is the sum of v/c and cosine of the angle α'

$$v_y = \cos\alpha' + \frac{v}{c}. \tag{88}$$

From these two components, we can calculate the angle α between the direction of the light beam with respect to the predominant gravitational field and the direction of the movement of the light source within the predominant gravitational field by using the tangent function

$$\tan\alpha = \frac{\sin\alpha' \times \sqrt{1 - \frac{v^2}{c^2}}}{\cos\alpha' + \frac{v}{c}} \tag{89}$$

and therefore, we get

$$\alpha = \arctan\frac{\sin\alpha' \times \sqrt{1 - \frac{v^2}{c^2}}}{\cos\alpha' + \frac{v}{c}}. \tag{90}$$

Relativistic physics gets the same results for the changing of inclination angles of electromagnetic radiation by the movement of a source of electromagnetic radiation, as for example, the so-called synchrotron radiation, by a different, but similar derivation, which is not mentioned here. The proof of the existence of the so-called synchrotron radiation was again taken as an argument for the correctness of the Theory of Special Relativity.[23] As an example, I wish to calculate the changes of angles of light beams in a moving light clock, which is differently inclined toward the direction of the movement of the light clock in a very much predominant gravitational field. At the bottom of the tube of the light clock shall be a light source and on the top of the light clock shall be a reabsorbing plate, so that we do not need to regard the movement of a light beam, which is traveling up and down between two mirrors, as Einstein did, but only from the bottom light source to the top reabsorbing plate. When reaching the top reabsorbing plate, the light clock shall tick and at the same moment the next light beam shall be emitted by the bottom light source. The chosen velocity of the light clock shall be 0.9 c, see Table I. As sin α corresponds directly with a certain velocity of the light beam within the light clock, by correlating sin α with sin α' by forming the quotient of both angles we get the relative values of sin α in respect to sin α' and therefore directly the relative values of the velocity v_p of the light beam within the moving light clock, while the relative velocity of the light beam with respect to the predominant gravitational field is still c (=1). The inclination angle $\alpha' = 0° = 360°$ of the light clock, in which the light beam is traveling directly in the direction of the moving light source, does not change, so that $\alpha = 0° = 360°$. To get, in this case, the velocity of the light beam with respect to the light clock, we have to subtract the velocity of the light clock with respect to the predominant gravitational field from the velocity c (with respect to the

TABLE I. There exist different deceleration factors of physical processes. The boldface values correspond with the time dilatation postulated by relativistic physics.

α'	α (v = 0.9c)	$\sin\alpha/\sin\alpha' = v_p = 1/\gamma$	Factor of deceleration $1/v_p = \gamma$
0°	0°	c − v = 0.1	10
30°	7.035292°	0.2449614	4.0822758
60°	15.090185°	0.3006137	3.3265282
90°	**25.841933°**	**0.4358899**	**2.2941573**
120°	43.341759°	0.7925271	1.2617865
150°	81.139693°	1.9761336	0.5060387
180°	180°	v + c = 1.9	0.5263158
210°	278.860307°	1.9761336	0.5060387
240°	316.658241°	0.7925271	1.2617865
270°	**25.841933°**	**0.4358899**	**2.2941573**
300°	344.909815°	0.3006137	3.3265282
330°	352.964708°	0.2449614	4.0822758
360°	360°	c − v = 0.1	10

predominant gravitational field) of the light beam, so that we get

$$v_p = \frac{1}{\gamma} = c - v. \tag{91}$$

The inclination angle $\alpha' = 180°$ of the light clock, in which the light beam traveling directly in the opposite direction to the moving light source, does not change, so that $\alpha = 180°$. To get, in this case, the velocity of the light beam in respect to the light source, we have to add to the velocity c (with respect to the predominant gravitational field) of the light beam the velocity of the light source with respect to the predominant gravitational field, so that we get

$$v_p = \frac{1}{\gamma} = c + v, \tag{92}$$

see Table I. To calculate the gravitational deceleration factor of motion on average for all angles seems to be very difficult. But adding the gravitational factor of deceleration for pairs of angles $(\alpha' + 180°)$ we always get a median gravitational factor of motion γ of 2.2941573. For example: for a moving light clock (v = 0.9) with an inclination angle α' of 30° the gravitational factor of deceleration γ is 4.0822758 and for the a moving light clock (v = 0.9) with an inclination angle α' of 210° $(\alpha' + 180°)$ the gravitational factor of deceleration γ is 0.5060387. For this pair of angles, we get the median gravitational factor of deceleration of

$$\gamma = \frac{4.0822758 + 0.5060387}{2} = 2.2941573. \tag{93}$$

This is exactly the factor γ, as calculated by relativistic physics for the so-called time dilatation in the case of a light source moving with a velocity of 0.9c, see Table II. We want to check, if this is also the median gravitational factor of deceleration for pairs of angles $(\alpha' + 180)$ with an extremely inclined angle, for example, for the pair of angles $\alpha'_1 = 0.00001°$ and $\alpha'_2 = 180.00001°$. We, get in this case, for $\alpha'_1 = 0.0000022941573387$ $(\gamma_1 = 4.35889894354)$ and $\alpha'_2 = 180.0000435889894354$ $(\gamma_2 = 0.22941573387)$

$$\gamma = \frac{4.35889894354 + 0.22941573387}{2}. \qquad \gamma = 2.29415733870 \tag{94}$$

More examples of pairs of angles would lead to the same result. We can therefore go from the assumption that the median gravitational factor of deceleration for pairs of angles $(\alpha' + 180°)$ is always the same and corresponds with factor γ of relativistic physics, with the exception of the pair of angles of 0/180°. The gravitational factor of deceleration γ of the pair of angles of 0/180 degrees is 5.263158. But as this is the only exception, this factor is not really relevant. Let us, for example, take all pairs of angles $(\alpha' + 180°)$ with an difference of 10^{-12} angular degrees. In this case (v = 0.9 c) we get 18×10^{12} pairs of angles for the whole circle of 360°, of which the pair of angles of 0/180° causes a median gravitational factor of deceleration of 5.263157894736842 and all other pairs of angles cause a median gravitational factor of deceleration γ of 2.2941573 (2.294157338705618).

For the median factor γ on the whole we get in this case 2.294157338705782. Now it is simply understandable, why basic physical processes, as processes, which move to and fro (oscillation of atoms) or circular processes within atoms, as for example, in atomic clocks, decelerate by motion of the atoms within a predominant gravitational field by the gravitational deceleration factor of motion γ, which is called the relativistic factor in relativistic physics. But γ defined according to relativistic physics represents only a medium value of the duration of basic physical process, while the factor of deceleration is permanently changing in reality and only for the special case of a vertical traveling light beam or a vertical intra-atomic motion falls together with γ, as it is defined by relativistic physics. For a light source moving by 0.9 c relativistic physics calculates a time dilatation of (c = 1)

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{1}{\sqrt{1 - \frac{0.9^2}{c^2}}} = 2.2941573. \tag{95}$$

According to the derived changes of angles of circular basic physical processes, which take place with the velocity

TABLE II. The so-called time dilatation factor is in reality a medium deceleration factor of physical processes. The boldface values correspond with the time dilatation postulated by relativistic physics.

α'	Factors of deceleration $[(1/v_p = \gamma) + (1/v_p = \gamma)] : 2$ (v = 0.9)	Medium factor of deceleration Ø
0°/180°	(10 + 0.5263158) : 2	= 5.263158
30°/210°	(4.0822758 + 0.5060387) : 2	= 2.2941573
60°/240°	(3.3265282 + 1.2617865) : 2	= 2.2941573
90°/270°	**(2.2941573 + 2.2941573) : 2**	= 2.2941573
120°/300°	(1.2617865 + 3.3265282) : 2	= 2.2941573
150°/330°	(0.5060387+ 4.0822758) : 2	= 2.2941573

of light within a very much predominant gravitational field, as of intraatomic processes of motion, of processes within elemental particles, or as, for example, of the spreading of an electromagnetic radiation or the radial spreading of elemental charges, by the movement within a predominant gravitational field there should result a deformation of, for example, a radial spreading electromagnetic field, so that the particles or electrical fields are shortened in the front and in the back, which could in fact be observed at Coulomb fields of electrons moving with a fast velocity. But this has nothing to do with the so-called relativistic length-contraction. The so-called dilatation of time by the factor of γ is derived by relativistic physics by the special case of a vertical transmission angle with respect to the moving direction of the light source and is then generalized for all other transmission angles, which shall be allowed because of the principle of relativity. According to the principle of relativity, as it is postulated by Relativistic Physics, it must also be allowed to take the kind of light clocks I introduced above, to derive the results of Relativistic Physics, as for example, the value of γ. We therefore again want to use for our considerations in the following this kind of light clock with a light source at the bottom of the tube of the light clock and with a reabsorbing plate on the top of the light clock, as already mentioned above. When reaching the top reabsorbing plate, the light clock shall tick and at the same moment the next light beam shall be emitted by the bottom light source.

Let us assume that by the movement of a light source there will result a change of the duration of time. And also, let us assume that the principle of relativity shall be valid, as it is postulated by relativistic physics. In this case, it must be allowed to derive the change of the duration of time not only from a light beam, which is emitted vertically to the direction of the movement of the light source, but also from any other angle of transmission with respect to the direction of the movement of the light source. Let us calculate the factor γ, by which the duration of time would change in the case of an inclination angle of the light clock of 150° with respect to the direction of the movement of the light clock and therefore in the case of a light beam, which is emitted by a transmission angle of 150° with respect to the direction of the movement of the light clock (v = 0.9 c), which is almost in the opposite direction from the direction of the movement of the light source. In this case, we would get for γ the value of about 0.5, what means, that the duration of time would shrink by the factor of about 0.5 (see Tables I and II). If we calculate the factor γ, by which the duration of time would change in the case of a light beam, that is emitted by a transmission angle of 90° (vertically) with respect to the direction of the movement of the light clock, respectively, the light source (v = 0.9 c), we get a change of the duration of time by the factor of about 2.3, so that the duration of time would dilate by the factor of about 2.3. If we calculate the factor γ, by which the duration of time would change in the case of an inclination angle of the light clock of 30° with respect to the direction of the movement of the light clock (v = 0.9 c), we get a change of the duration of time by the factor of about 4.0, so that the duration of time would dilate by the factor of about 4.0, and so on. According to the relativistic principle of relativity the observer, which does not move with the observed light source (v = 0.9 c) emitting electromagnetic radiation radial, does not ascertain only a dilatation of time by the factor of 2.3 for the moving light source, as it is postulated by Einstein and relativistic physics, but must also ascertain a shrinking of the duration of time for the light source, if he observes a light beam with an angle of transmission of, for example, 150° (by the factor of about 0.5), and must ascertain a dilatation of the duration of time for the light source, if he observes a light beam with an transmission angle of, for example, 30° (by the factor of 4.0). All these statements must be valid alike, if the relativistic principle of relativity, which is the fundamental principle of Einstein's Theory of Special Relativity, shall comply reality. But in observing a moving light source, the duration of time cannot get accelerated and decelerated for this light source at the same time, so that we have to ascertain, that on the basis of relativistic physics we get inconsistent and contradictory results.

XI. AN ALTERNATIVE EXPLANATION OF SO-CALLED "GENERAL RELATIVISTIC PHENOMENA" USING THE POSTULATION THAT THE VELOCITY C OF LIGHT ORIENTS ON THE PREDOMINANT (QUANTIZED) GRAVITATIONAL FIELD

As I have proved in this article that relativistic physics uses Einstein's fictitious theory of relativity, which we have deprived of its basis, we have to look for alternative explanations that capture the reality behind the so-called "relativistic phenomena." An alternative theory using a quantized gravitational theory I introduced already 2011 in Physics Essays ("On the new theory of Gravitation"),[15] which I improved in another article 2016 ("Unification of the four fundamental forces of nature by a binary quantum model").[24] With the "New Theory of Gravitation" (NGT), it was easily possible to calculate the correct value for the perihelion precession of

Mercury,[20] as well as for the seemingly relativistic phenomena at the binary star system PSR B1913 + 16.[21,22] The observations at the binary star system PSR B1913 + 16 were celebrated as a first indirect "proof" of gravitational waves. The "NGT" presents a quantized gravitational field, in which gravitational quanta move with the speed of light emitted by a certain mass. If a mass, for example, Mercury moves within the quantized gravitational field of the Sun, it will meet more quanta, as if it was at rest against the quantized gravitational field of the Sun. Hereby, of course, there must result additional gravitational effects that Newton could not comprehend with his theory. These effects can be calculated within usual three-dimensional space, by advancing Newton's theory of gravitation in a very simple way. By the NGT also the seemingly "mass increase" and the equivalence of inert and heavy mass could be derived, as well as the equation $E = m \times c^2$ and the correct value for the deflection of light at the Sun.[19]

XII. WHY IS THE "NGT" AND ITS POSTULATION THAT THE VELOCITY C OF LIGHT ORIENTS ON PREDOMINANT (QUANTIZED) GRAVITATIONAL FIELDS IS A BETTER THEORY THAN EINSTEIN'S THEORY OF RELATIVITY?

Einstein's theory of relativity needs several subsequent constructions, as the Lorentz contraction, the Lorentz transformation, the relativistic addition of velocities to explain the so-called relativistic phenomena. According to the theory of the author, the Lorentz contraction, the Lorentz transformation, the relativistic addition of velocities, the "time dilation" (which in reality is a change of the duration of physical processes) and the imagination of a four-dimensional space time are not needed to explain so-called special and general relativistic phenomena. To preserve the postulation of Einstein that the velocity of light is constant and always c in a vacuum against any inertial frame, there must be introduced pseudo forces, as the pseudo centrifugal force and the pseudo gravitational force. The theory of the author does not need the differentiation between real and pseudo forces. Gravitation is according to NGT a real force and there is no four-dimensional space-time needed to explain the gravitational effects. According to the NGT of the author, so-called special and general relativistic effects are simple additional gravitational effects caused by the motion of electromagnetic waves or masses within quantized gravitational fields. The relativistic effects can be calculated within usual three-dimensional space, by advancing Newton's theory of gravitation in a very simple way, which can be understood by everybody with a normal intelligence, while especially Einstein's general theory of relativity is famous for its complexity. The orbits of the planets keep orbits and are not interpreted as straight movements, which only seem to be curved. Contradictory interpretations of the Michelson–Morley experiment,[1] the Hafele–Keating,[17] and the Michelson–Gale experiment[8,9] disappear, if one goes from the imagination that the velocity of light in vacuum is always c within the predominant gravitational field, as the gravitational field does not rotate with the Earth around its axis.

Another seemingly verification for the Einstein's theory of special relativity is the longer lifetime of moving muons. Decaying particles life longer than resting particles, what is predicted by special relativity and can be measured in particle lifetime experiments. According to special relativity, the rate of clock traveling with the muons is slowed with respect to the laboratory clock rates of the researchers. Therefore, the lifetimes of unstable particles such as muons should be longer. Physicists measured the distances muons could fly within the atmosphere of the Earth before they decayed. The distances were longer than predicted by classical physic and the measurements and were consistent with the predicted values of relativistic physics. The longer distance the muons can fly is interpreted as a proof of time dilatation and/or the "length contraction" as postulated by relativistic physics. Also, according to the model that the velocity of light cannot be faster than c within the predominant gravitational field, decay processes must decelerate, if a muon is moving within the atmosphere of the Earth with a certain velocity, so that the decay process must decelerated. No time dilatation or length contraction is needed to explain this. But why should electromagnetic radiation orient with its velocity on the predominant gravitational field? As explained in my former articles the velocity c of the light beam is an energetically preferable velocity and from the sight of the minimum energy principle a necessary velocity.[14,15] If we apply Ockham's razor, this can result in only one decision: NGT and its fundamental postulates are preferable against Einstein's theory of relativity. Besides, the NGT is easily compatible with Quantum Physics.

XIII. CURRENT TRIUMPH OF EINSTEIN'S THEORY OF GENERAL RELATIVITY: THE DIRECT DETECTION OF "GRAVITATIONAL WAVES" BY THE LASER INTERFEROMETER GRAVITATIONAL-WAVE OBSERVATORY (LIGO AND VIRGO)

To detect so-called gravitational waves directly, in the following huge devices were built, using huge Michelson–Morley Interferometers, as for example, LIGO in USA and Virgo in Australia. On September 14, 2015, two detectors of the Laser Interferometer Gravitational-Wave Observatory (LIGO) first simultaneously observed a transient gravitational-wave signal. On December 26, 2015, a gravitational-wave signal produced by the coalescence of two stellar-mass black holes was observed by the twin detectors of the Laser Interferometer Gravitational-Wave Observatory (LIGO). On August 17, 2017, the Advanced LIGO and Advanced VIRGO gravitational-wave detectors made their first detection of gravitational waves produced by colliding neutron stars.[25–27] But what does the direct detection of gravitational waves mean? "Thinking within the box" of relativistic physics, the so-called direct detection of gravitational waves by Laser Interferometer Gravitational-Wave Observatories must of course be caused by a dilation and contraction of the postulated "four-dimensional space-time," as the velocity of the laser rays moving within the vacuum tubes must always be c. "Thinking outside the box" of relativistic physics the gravitational waves just changed the strength of the predominant gravitational field of the Earth for a short moment causing also a change of the velocities of the laser rays resulting in an interference pattern. Latter sounds much less spectacular than the assertion of relativistic physics, spread over the whole world, that Einstein's ideas were proved again by the evidence of gravitational waves, which dilated and contracted "space-time" for a moment. In my former article "On the new theory of gravitation" I thought that the gravitational field of the Earth is so predominant that it would not be possible to detect gravitational waves passing through a Laser Interferometer Gravitational-Wave Observatory because the constant velocity of light should be guaranteed by the predominant gravitational field of the Earth. But obviously the gravitational waves– detected by Laser Interferometer Gravitational-Wave Observatories are strong enough, that a disturbance of the movement of the laser rays can happen for a short moment, causing a short change of the velocity of the laser rays, which shortly afterward move again with the constant velocity c within the predominant gravitational field of the Earth through the tubes of a Laser Interferometer Gravitational-Wave Observatory.

XIV. CONCLUSIONS

As pointed out above, there exist several misinterpretations of experiments, which claim to verify Einstein's theory of relativity, beginning with the misinterpretation of the Michelson–Morley experiment already by Lorentz. In the following curious explanations of so-called relativistic phenomena happened, for example, James Terrell introduced the so-called Terrell rotation, which explains by the (nonexistent) Lorentz factor, why the (nonexistent) Lorentz contraction cannot be observed. Because the Lorentz factor γ and space contraction had suited so well to the Einstein's time dilatation factor $1/\gamma$, which is in reality not a time dilatation factor, but a medium value of a slowing and accelerating factor of physical processes, Einstein and other physicists did not think on the necessity to examine the foundations of relativistic physics more precisely. Instead Einstein 1915 developed his general theory of relativity from the special theory of relativity, which is itself consistent and recently celebrated its hundredth anniversary. So-called relativistic phenomena exist without doubt, but we should explain these phenomena in a nonrelativistic way. All so-called relativistic phenomena can be explained by simple nonrelativistic considerations going from the imagination that the velocity of light is only constant and always c in a vacuum within a predominant quantized gravitational field, but not constant with respect to any moving inertial frame. During the last decades new phenomena were observed, which could not be explained by Einstein's theory of gravity (the so-called theory of general relativity), as for example, the Allais-Effect, the anomalous secular increase of the moon orbit eccentricity, the so-called "dark energy" and "dark matter." All these phenomena can be described by simple gravitational motion effects of masses moving within usual three-dimensional quantized gravitational fields, as explained in my former articles.[14,15,24,28] Never Einstein's theory of relativity was questioned seriously after having detected these phenomena because the basis of the theory of relativity, the dogma of an invariant velocity of light, is not allowed to be questioned. Instead of realizing that Einstein's theory might be wrong, again and again additional effects and theories were postulated, in order to prevent Einstein's theory of relativity from being replaced by an alternative theory.

Again and again general relativity is tested successfully, as at the binary pulsar system PSR J0737–3039 and at the pulsar and a white dwarf system PSR J0348 + 0432 and Einstein's general theory of general relativity seems to be confirmed superbly.[29,30] But, as I pointed out in one my former articles, it is possible to predict up to 12 decimal digits right of the decimal point the alteration of time of the arrival at the periastron per one revolution at the binary star system PSR 1913 + 16 without using general relativity, but by using the NGT,[15] which I approved in another article.[24] My simple calculations can also be used for calculating the conditions at the binary systems PSR J0737–3039 and PSR J0348 + 0432. For the physicists "testing" general relativity, Einstein's theory of relativity is confirmed again and again. Once accepted wrong axioms for a certain mathematical theory, the theory is consistent and cannot be disproved by this mathematical theory any more. The same happened to Einstein's general theory of relativity. Einstein was a scientist who was able to conjure away contradictions of the foundations of his theory of relativity, what was misjudged as ingeniousness. Almost every day one can read in the media that Einstein's general theory of relativity has been proved again. The general theory of relativity can only indirectly be falsified, if its foundations are falsified, namely, of the invariance of the velocity of light. As I refuted the dogma of relativistic physics, that the velocity shall be constant against any inertial frame, the special and general theory of relativity are falsified. In my opinion a paradigm shift in physics is overdue. But the necessary paradigm shift is even more difficult to realize than the paradigm shift from the Ptolemaic cosmology to the Copernican cosmology in the 16th century because so-called relativistic phenomena elude our immediate notion and because most of the physicists meanwhile dogmatically believe in the theory of relativity of Albert Einstein. Like the Ptolemaic theory was an artificial theory, by which one could get exact predictions, as for example about the orbit of Mars, Einstein's theory of relativity is also an artificial theory, by which one get even more exact predictions, as for example, about the orbit of Mercury and binary stars, but both do not correspond with reality.

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