Metaphysical basis for a unified world view: Definition of space and time

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Overview

Theoretical physics has been in a deep crisis for decades. Quantum theory and general relativity remain incompatible. It remains to be seen how the basic concepts of our universe - space and time - can be explained. The question is also open as to whether life arose by chance from dead matter, whether a Creator created life from dead matter, or whether life works before space and time, and space, time and matter are consequences of life. In this article, the essence and origin of space and time are to be discussed and explored in a metaphysical approach. With a definition of space and time that combines mathematics and theoretical physics, the meaning and nature of the speed of light is represented as a "clock". As a result, the irrational system of values or units of modern society is identified as the cause of the crises of modern societies.

1 Without a uniform world view of humanity, no uniform self-image of man

The "self-image" of man, since what man assumes about his own existence, its purpose and destiny as well as about the functioning of life within himself, is essentially a reflection of his "world view". Thus, man is a reflection of what he assumes about the existence of the universe, its purpose and destiny as well as its functioning or the laws of nature that work in the universe and thus also in man himself.

However, as long as the fundamental questions relating to the universe cannot be answered, as long as quantum theory and general relativity cannot be united and are in contradiction to each other, as long as theoretical physics as the "heart" of the natural sciences cannot conclusively explain the functioning and nature of space and time and the origin of life logically and consistently, as long as people and societies will argue about their different worldviews and – because apparently survival depends on the attention to the "right" and only true world view – fight wars. At the same time, the choice of a "wrong" world view or the assumption of wrong laws of nature leads to people unintentionally violating the "right" laws of nature and thus possibly endangering their own livelihoods.

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An "objective" truth in the sense of a "common" truth for a community of people can only arise through the formulation of a closed set of statements (formulas) that can be recognized by each individual as truth or untruth through examination in experiments. Only if all individuals agree with the statements / formulas underlying a unified world view, because each individual can check them in experiments and find them true , can a "common" truth arise. A distinction to mere "belief" arises from the requirement that the statements / theory must basically be falsifiable in experiments.

Such experiments are always associated with a "measurement" of physical quantities or represent a measurement (in the sense of a comparison of several observations) of physical quantities. A "measurement" of physical quantities is always a "comparison". A physical quantity is compared qualitatively and quantitatively with a comparable physical quantity by "defining" a physical quantity, a unit of measurement and thus simultaneously a measuring process or a measurement specification for this purpose.

However, (according to Aristotle's idea) two categories of definition can be distinguished from each other: the "real definition" and the "nominal definition". While the real definition describes a (physical) object or a physical property of the object or object of observation informatively and represents a hypothesis that can be true or false, a nominal definition is a binding determination in which a term is replaced or defined by other (already real or nominally defined) terms. According to this assessment, nominal definitions cannot therefore be false or untrue. However, a theory based on nominal definitions or a statement about reality can be falsified by an experiment.

> ➔ A unified universally valid world view, a "world formula", must first and foremost provide nominal definitions of space and time as a bindingly agreed measuring instrument and as a measurement guideline for measuring the universe. Space and time as the "stage" of world events cannot be explored in experiments, but must be agreed as a uniform "measuring instrument" and made available for experiments. Only if the terms space and time are nominally defined can a statement or theory about reality be formulated using these terms that is falsifiable. As long as the concepts of space and time are defined with real definition, a theory based on those definitions cannot be falsified, because then it always remain unclear whether the theory or statement about reality or the definitions of the terms used in the statement are false or untrue.

What happens when scientists try to approach the concept of time with a real definition can be exemplified in a recent discussion on the concept of time between the neuroscientist Dean Buonomano and the well-known physicist Carlo Rovelli: "Bridging the neuroscience and physics of time"[1]. After reading, the reader is little more knowledgeable than before, because it remains completely unclear what time should ultimately be and how to define the concept of

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[1] Dean Buonomano and Carlo Rovelli, 2021, Bridging the neuroscience and physics of time :
https://doi.org/10.48550/arXiv.2110.01976

time in one or two sentences conclusively nominally, so that even a layman or a child can understand this.

2 Troubleshooting: The problem with time

If one embarks on troubleshooting, i.e. on the search for the cause of the problem in the sciences that has existed for decades, that no union of quantum theory and general relativity can be formulated, one inevitably encounters the "problem with time".

Even for laymen, the problem can be illustrated briefly and succinctly: atomic clocks run slower on the sea surface than on the mountain top, hourglasses run faster on the sea surface than on a mountain top. Both hourglasses and atomic clocks are therefore "influenced" by gravity, but in the opposite direction. A sundial behaves differently. This runs at the same speed both on the sea surface and on the mountain top.

Which watch is the right one or how can you measure time meaningfully at all. What is time anyway? The confusion in theoretical physics goes so far that researchers in the field of quantum gravity even consider "time" to be an illusion that is not real at all. "Does time exist in quantum gravity?" asks theoretical physicist Claus Kiefer in a 2004 essay. [2]

How did this confusion come about with regard to the so important and central physical quantity of "time"?

Isaac Newton omitted a definition of time in his contributions and simply assumed it as known and springing from perception (given by God):[3]

> *"Time, space, place and movement as known to all, I do not explain. I only notice that one usually understands these quantities no differently than in relation to sensually perceptible, and thus certain prejudices arise, for the abolition of which they are suitably distinguished into absolute and relative, true and apparent, mathematical and common quantities."*

In his work of 1905 ("On the electrodynamics of moving bodies"), Albert Einstein wrote in the introduction under §1 "On the definition of simultaneity": [4]

> *"It might seem that all the difficulties concerning the definition of 'time' can be overcome by putting the 'position of the small hand of my watch' instead of 'time'. Such a definition is indeed sufficient when it comes to defining a time exclusively for the place where the clock is located: however, the definition is no longer sufficient as soon as it is a question of linking series of events taking place in different places in time or – which amounts to the same thing – evaluating events that take place in places distant from the clock in time. "* (page 893)

   He continues:

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[2]Claus Kiefer 2009. Does Time exist in Quantum Gravity? https://arxiv.org/pdf/0909.3767.pdf

[3] Newton Isaac 1686 . Philosophia Naturalis Principia Mathematica
[4] Albert Einstein 1905 On the Electrodynamics of Moving Bodies

http://myweb.rz.uni-augsburg.de/~eckern/adp/history/einstein-papers/1905_17_891-921.pdf

> *"We arrive at a far more practical determination by the following consideration. If there is a clock in*
> *point A of the room, an observer in A can temporally evaluate the events in the immediate vicinity of A*
> *by visiting the clockwise positions at the same time as these events. If there is also a clock in point B of*
> *the room – we want to add, 'a clock of exactly the same nature as the one in A' – then a temporal evaluation*
> *of the events in the immediate vicinity of B by an observer in B is also possible."* (page 894)

Unlike Newton, Einstein defines very precisely what "time" should be in the physical sense. With regard to Einstein's considerations, however, it should be noted that a clock in a "point A" of space is an idea that presupposes the idea that time can physically exist in real life even without space, alone in a "point" of space without spatial expansion.

However, this basic assumption, which Einstein precedes his further considerations and explanations, is a hypothesis or a claim (there is a "time" in point A) that cannot be verified at all. This could neither be proven nor refuted. A clock, regardless of its nature, without spatial expansion, we can not design as a "measuring device" to prove this time and can not imagine such a clock mentally.

Against this background, Einstein's premise seems irrational. However, this contradiction is concealed by the fact that Einstein introduces and uses two different terms or concepts of time: On the one hand, a time that is measured by the nominal definition of the properties of light (constant speed in empty space), i.e. is actually physically measurable and verifiable. However, this "time" is always measurable only between two points in space: If a beam of light leaves point A and arrives at point B some time later, the elapsed time results from the natural constant of the speed of light. At the same time, however, Einstein continues to use the hypothesis for his theories that time also exists and passes in a point in space. However, by Einstein's definition, this is not measurable, since it is supposed to exist in a point without volume, i.e. in "nowhere" without space. It seems that with this second concept of time, which is independent of the speed of light, Einstein links the causality principle, i.e. the discrete sequence of "events", with the concept of time.

If one takes a look at the definition building of modern science – the "value system" of modern society, so to speak (the "Bureau International des Poids et Mesures" today counts 100 member states and associated states and economies.) – for the "measurement" of the universe, it becomes apparent that both concepts of time introduced by Einstein are addressed in the basic units. The time, which can be measured by the constant speed of light, is incorporated into the measuring system of the base units by the nominal definition of the length of space, the meter. With the one concept of time mentioned by Einstein, the length of space is defined on the basis of the constant speed of light. The other concept time, which is intended to give "events" an order even in the absence of space and matter in every imaginary space point, finds its way into the definition of the second:[5]

> "One second is 9,192,631,770 times the period duration of the radiation that corresponds to the
> transition between the two hyperfine structure levels of the ground state.
> of atoms of the nuclide corresponds to 133Cs"

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[5]   Bureau International des Poids et Mesures: https://www.bipm.org/en/home

This concept of time, defined on the basis of the caesium atom, actually defines the concept of causality, because time is quantified by counting the periods. A unit of time smaller than 1/9192631770 second cannot be measured with the clock defined in this way. Now, however, it has already been mentioned here that a clock cannot exist without spatial expansion (with an atom you can not measure the time in a space point, since an atom has a spatial expansion). This definition of time on the basis of an atomic clock thus in no way does justice to Einstein's idea of a ("second") time independent of space and matter. In addition, this definition is also a real definition, since it is undefined what exactly an atom is. However, as shown, such a definition is not suitable for formulating falsifiable theories. The definition of time and the definition of space should only enable the "standardized" investigation of the properties of atoms (mass). Thus, the physical quantity of time cannot be defined by what is to be measured or researched with it.

On closer inspection, this definition of time is therefore a "circular definition" (idem per idem), since the concept of the duration of the period is defined solely by the concept of the duration of the period. The definition of the time of BIPM is paraphrased:

$$T_{Second} = \ \ 1\,Second = 1\,\frac{1}{f_{133Cs}} = 9192631770 \ \cdot \ T_{133Cs}$$

The philosopher Karl Christian Friedrich Kraus formulated in 1836 as a "basic law of definition":

> "The first demand is: what is to be defined must not appear again in the definition (terminus definitus non debet ingredi definitionem), because if this were, one does not know what is to be defined, it would be explained the same by the same."[6]

However, this is precisely the case with the definition given by BIPM for the most basic quantity in science and thus with the basis for all our world view. Only a dimensionless factor (9192631770) distinguishes what is to be defined (a period duration) from the definition (a period duration).

Thus, here is the searched "error" regarding our image of space and time found and identified:

Due to the fact that the central measurand in natural science (time) is defined as a circular definition, there are an infinite number of "possible" worldviews, because it remains open what time should actually be and how it could be measured. On this basis, a "common" reality, a "common" (uniform) world view cannot be formulated, because depending on the choice of the

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[6]   Karl Christian Friedrich Krause: Die Lehre vom Erkennen und von der Erkenntnis, als erste Einführung in die Wissenschaft. Lecture for educated people from all levels. Dietrich'sche Buchhandlung, Göttingen 1836, p. 502.

clock (atomic clock, sundial, hourglass) completely incompatible world views arise. Atomic clocks, on the basis of which "science" currently wants to measure time, measure neither the

one nor the other time mentioned by Einstein, but simply the strength of gravity at the location of the atomic clock.

3 Error correction: Definition of space, time and speed

In order to formulate a definition of space and time suitable for a uniform world view, one can start with the thoughts already formulated by Albert Einstein and further refine the essence of space and time and their connection with each other and name them more concretely.

The concepts of space and time seem to arise immaterially as mental concepts in our consciousness. Namely about the concept of movement. If a (imagined) physical appearance (e.g. the universe we observe) moves relative to the observer (ourselves), then in our imagination this movement traverses a certain length of space per a certain duration of time.

We define the concept of movement as a fundamental sensory experience inherent in all of us in general by the concept of (spatially directed) "speed" v = length of space / duration of time.

What we can now deduce from our own as well as from Einstein's considerations is that we combine two very different mental concepts about the universe in the term "time", namely on the one hand the principle of discrete successive events or the concept of causality (yesterday is cause for today and today is cause for tomorrow) and on the other hand the concept of (continuous) "movement", which cannot be divided into discrete events. With regard to the term "movement", space and time (as a continuum) are linked, but they are not linked with regard to the term causality (discrete events of cause and effect).

It can therefore be seen that in the sense of a definition of space and time that can be used for measurements and experiments, the concept of time must necessarily be separated into these two different aspects of our perception. On the one hand, time must be nominally defined as a "measurable" quantity for physics (in order to be able to measure "movement"), on the other hand, a physical quantity must not be used to define what is cause and what is effect, since this is only to be found out through experiments based on the definition of measurable time.

If one considers how we have always measured time from a historical point of view and as Einstein also formulated it, time measurement is carried out quite practically via the position or rotation of the hand of an analog clock or also on the basis of the position of any other rotation of a body, for example the rotation of the earth around its own axis, i.e. a (circular) movement, which we consider to be uniform (same spatial lengths / durations). Thus, geometrically speaking, time is actually measured as a solid angle between three spatial points and the length of space as the shortest "straight" distance between two points in space.

Since the concept of causality (past, present, future) must not be the subject of the definition of space and time as physical quantities, the definition of space and time must therefore only be

derived from the concept of movement and the concept of movement accordingly from the concepts of space and time:

> **Time** is nominally defined by the definition of "movement" and by the definition of space

> **Space** is nominally defined by the definition of "movement" and by the definition of time

> **Movement** is nominally defined by the definition of space and by the definition of time.

$$motion \ = \ \frac{space \ (-length)}{time \ (-duration)}$$

Since "time" in the physically measurable sense can only be defined as an angular measure, time and space can now only be defined by the concept of π (by the concept of the circle). Here, π (symbol for the ratio of circumference of a circle to its diameter) is not understood as a dimensionless "number ratio", but as a rotation, which describes the ratio of time (circle circumference) to space (circle diameter).

This becomes clear when the reader imagines an observer who is not a volumeless point, but a voluminous body that rotates around two axes of its own in order to "scan" or visually observe its environment with this "movement". By the speed of his own rotation, the observer determines the speed at which the universe rotates around him relatively. The observer himself is therefore the "authoritative" "space-time clock" or universal measuring instrument.
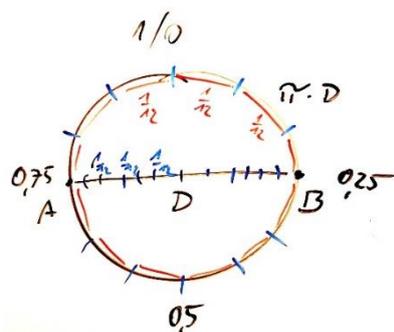
Since time units (angular units) can only be measured on the basis of units of length and units of length only on the basis of time units, the definition of space and time can only be carried out in such a way that in relation to two space points A and B in principle infinitely many infinitely small units of length are set in relation to an infinite number of infinitely small angles. The concept of infinity thus remains excluded from physics, just as the idea of a circle circumference as a "spatial length" remains excluded from mathematics, since π does not represent a "number", but a ratio of two different physical dimensions.

In other words, if the diameter of a circle is measured in the dimension "apples" and the circumference of the circle in the dimension "pears", then the quotient π as a quotient of 5 pears to 5 apples is not to be given as a dimensionless number in the sense of a factor, but as a ratio of 1 pear / 1 apple.

However, it is now also clear that any "mathematics" that describes or uses the ratio of circumference to diameter of a circle as 3.14..., i.e. as a dimensionless "number", is irrational

and not suitable for describing a rational world view. Both quantum theory and general relativity are therefore irrational in themselves, just as BIPM's definition of time is irrational.

(So it may be that "older mathematics" such as the "Rhind Mathematical Papyrus" (c. 1550 BC) is more rational than modern mathematics.)

By defining space and time on the basis of the concept of rotational motion, mathematics and physics are combined in such a way that the ratio of circumference to diameter of a circle does not represent a dimensionless number (or a factor), but are understood as two different physical dimensions, namely space (diameter = measure of length) and time (circumference = angular measure). π therefore does not have the value 3.14.... The expression $\pi = 1$ then describes a complete rotation of a rod (spatial length) around its own axis or the center of the rod.

$$1 \left[\frac{sesond}{meter}\right] = \frac{Circumference}{Diameter} \left[\frac{second}{meter}\right] = \infty \frac{\frac{\pi \cdot Diameter}{\infty}}{\infty \frac{Diamter}{\infty}} \left[\frac{second}{meter}\right] = \pi \left[\frac{second}{meter}\right]$$

Whether a circle and its diameter are divided into, for example, 360 angular degrees and 360 length sections or whether a revolution is set in relation to a length section is irrelevant and application-related. In principle, however, a "resolution" is always specified by the choice of the measuring instrument, i.e. the smallest possible measurable unit of time π determines how large the smallest possible measurable spatial unit is via the circle ratio. At the same time, the choice of ratio thus determines the highest possible "achievable" or "observable" speed (speed of light). The concept of the speed of the observed object is contrasted as a mirror image of the observer or the concept of the unified measuring instrument (definition of space and time).

$$v \left[\frac{m}{s}\right] \text{ (straight movement)} \quad - \quad \pi \left[\frac{s}{m}\right] \text{ (Rotational motion)}$$

It should be noted here that, contrary to Einstein's assumption, space-time does not have to be four-dimensional, but five-dimensional. Although there were attempts with the "Kaluza-Klein theory"[7] to construct a world view with five-dimensional space-time, but with four spatial dimensions and one time dimension. In fact, however, two angular dimensions or two time dimensions T_1, T_2 and three length dimensions or three spatial dimensions L 1, L 2 and L_3 are necessary for the uniform measurement or construction of space in the sense of three unit vectors .

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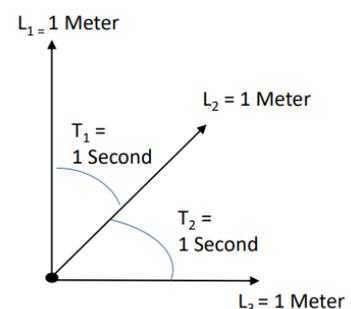
[7] M.J. Duff, 1994, Kaluza-Klein Theory in Perspective : arXiv:hep-th/9410046

A representation of 5-dimensional space-time between observer and observed:[8]

5-dimensional space-time$(0,5\ [\frac{s}{m}], 0,5[\frac{s}{m}], 1\ [\frac{m}{s}], 1\ [\frac{m}{s}], 1\ [\frac{m}{s}])$
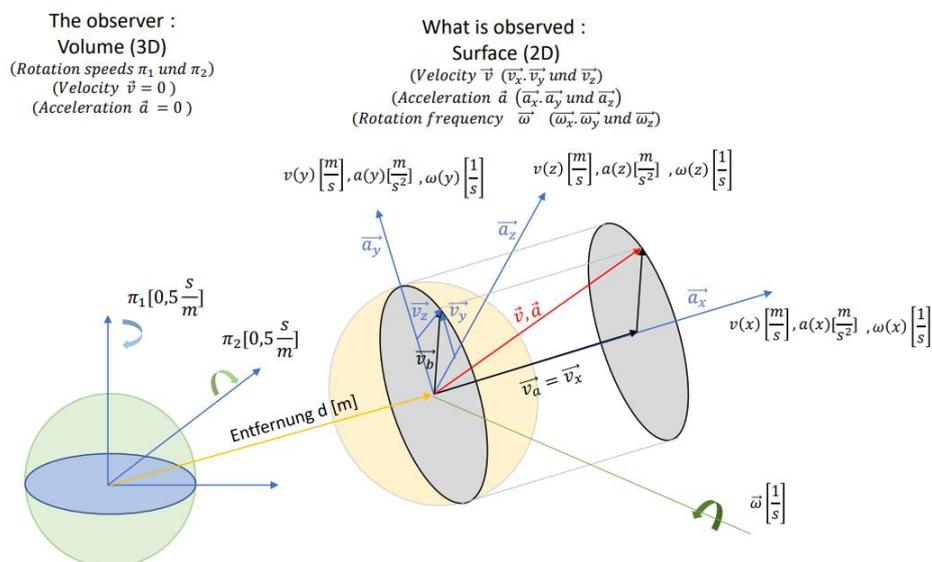
4 Planet Earth as a measuring instrument for space and time

With regard to the question of how a clock can now be constructed and defined on the basis of these considerations, the question of the meaning of the speed of light as a property of space-time and the question of the center of the universe are also relevant.

Basically, according to the considerations made here, each rotational body can be defined as a clock that sets time and space in a (measurable) ratio under the assumption of a uniform movement (constant rotation speed). For illustrative reasons, for example, with regard to the center of the universe, every observer is suitable to represent the center if we define it as a center, i.e. nominally define it as a center. It is important, however, that this center cannot be a volumeless point, but must have a volume so that its diameter can serve as a "unit of measurement" or scale for the measurement of the universe.

It is also important that not every person or every society defines his own center of the universe, but that all people agree to define a center or a "clock body" as the center, otherwise each person will formulate his own world view on the basis of his freely chosen clock body / center of the universe or his subjective point of view and dispute about the view of the universe and about the view of God under the mantle of different religions or different beliefs in science emerge, as it still exists today. The considerations made here show that it is irrelevant which body is defined as the center. However, it seems practical not to define the sun or a black hole as the center, but the planet Earth as our observation location, since we can only measure the planet Earth materially on foot and this is not possible with the sun or other bodies. If humans can and want to live on Mars, they would preferably define Mars as the center (clock body).

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[8] M.U.E. Pohl, Search for the World Formula/Theory of Everything, Scientific God Journal Vol 13, No 1 (2022) : https://scigod.com/index.php/sgj/article/view/781

That the constant speed of light postulated by Einstein appears to us as a natural constant results from the fact that in the past we assumed the Earth rotating around its own axis as the center of the universe by defining the duration and measure of length based on the Earth's rotation. For example, we have determined that a rotation of the Earth takes 24 hours and that the length of the circular arc from the equator to the North Pole should be 10,000,000 meters.

If one now nominally sets the rotational speed of the earth's body as a natural constant for determining the ratio or geometry of space and time, then the constant speed of light represents the nominally defined as constant rotational speed of the earth body, whereby the assumption of a uniform rotation is given and cannot be checked or falsified.

$$2\pi c \left[\frac{m}{s}\right] = \pi r^2 = \frac{Diameter_{Earth}^2}{CycleDuration_{Earth}} \left[\frac{m^2}{s}\right]$$
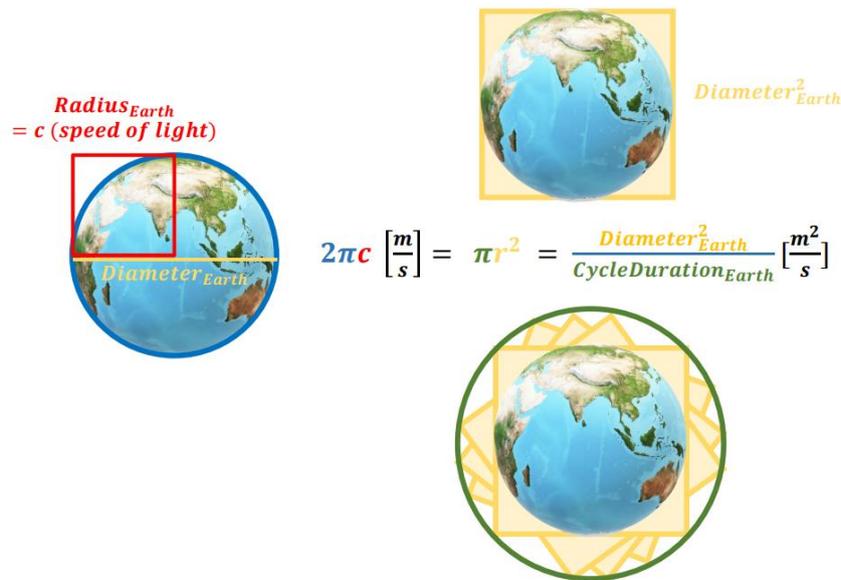
$$speed\ of\ light\ c = \frac{Diameter_{Earth}^2}{2 \cdot \pi \cdot Cycle\ Duration_{Earth}}$$

$$speed\ of\ ligth\ c = \frac{(12756270\ Meter)^2}{2 \cdot \pi \cdot 24 \cdot 60 \cdot 60\ Seconds}$$

$$speed\ of\ ligth\ c = 299746275\ \frac{m^2}{s}$$

(The deviation of the speed of light c given from the defined period duration to the ratio of the equator diameter is 0.0154% to the value of the speed of light at an altitude of 299792458 m/s determined by CODATA (Comitee on Data for Science and Technology).)

The speed of light is therefore not a natural constant, but is derived from π. Overall, it follows from the nominal definition of space and time made here that all natural constants are only an expression of π, so there are or can be no "natural constants" apart from π. [9] Taking into account that π itself represents the number "1" as a ratio, there are therefore no natural constants in the sense of "numbers".

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[9] M.U.E. Pohl, Unified Principles of Nature: Solution to the "Problem of Time", Scientific God Journal Vol 10, No 3 (2019) : https://scigod.com/index.php/sgj/article/view/669

5 Metaphysics as the basis of a unified world view (world formula)

Through mental analysis, it could be shown here that today's value system or system of units of modern societies contains a very serious and elementary error, because the basic units for observing the universe are irrationally defined and the definition of time by BIPM postulates without evidence and presupposes that the universe is mechanistically constructed, life has arisen from dead matter, or space and time are "created" by a supposedly inanimate caesium atom and a (living) "God" by definition does not exist and is accordingly not taken into account.

On the other hand, it was shown by mental analysis that space and time are constructed by the observer (ourselves / man) on the basis of the sensual (living) process of observing and perceiving movement and that life (man as observer) must thus logically apply to the "cause" and precondition for the emergence of space and time, which in turn represent a precondition for the existence of matter.

If the concept of time is divided into its two different and independent aspects, time results on the one hand from the concept of movement and on the other hand from the concept of causality. However, "measurable" is only the time that can be measured as a solid angle.

Time in the sense of the causality principle can thus be understood as a representation of the liveliness of ourselves and of the liveliness of the universe. A "scientific proof of God" follows immediately when the definition of time and space is no longer defined on the basis of an atom (as a substitute for God), but space and time are defined by the concept of a rotational movement (circle) from which then all triangles and even the golden ratio can be geometrically constructed.

For the existence of that time, which is not an angular measure but represents yesterday, today and tomorrow, can be sensually experienced by each of us every day and what else should this sensually tangible time represent than the living Almighty God?

As long as the modern sciences, through the erroneous or irrational definition of time and space, have in some way taken and claim for themselves the sovereignty of interpretation over the existence or non-existence and the will of God (without actually being able to meaningfully explain the phenomena in our universe), a unification of our world view with this system of values / units is not possible.