Pohl, M. U. E., Construction of 12D Spacetime in Detail and Definition of the fundamental measurement Units for space and time in Detail. Summary of findings regarding space and time, Derivation and experimental proof of 12 π c³ = 1

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Construction of 12-D Spacetime and Definition of the fundamental measurement Units for space and time in Detail.
Summary of findings regarding space and time, Derivation and experimental proof of $12\,\pi\,c^3 = 1$

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Abstract

In 2019 the author published the framework for a ToE or world formula in the form $12\pi c^3=1$. After 5 years of developing the framework further, the equation is now clearly explained using the Archimendian spiral and the physical background of the equation is illuminated. Then the construction of 12D space-time is explained in detail and the "problem of time" in physics is explained and solved in detail. The equation or the "world formula" is then proven experimentally by solving 7 natural constants against each other in an equation for the first time. This proves that there are no constants in nature other than the circle number π. The results shown here show and prove that contemporary physics and science as a whole convey and assert a fundamentally wrong view of the world that does not exist in reality. The main cause of the undesirable development appears to be the incorrect definition of the quality "time" in the physical system of units for measurement.

Content

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# 1 Summary of findings to understand nature of space and time

Notation:

T_1 : First Dimension Time ; T_2 : Second dimension time.. and so on.

L_1 : First dimension length ; L_2 : Second dimension length.. and so on.

It has been shown in the author's previous work that the number of circles represents the constant relationship and connection between the dimension time and length in space. Here, the length in space is to be understood as a (straight) distance between two points (AB) in space. Dimension Length (1 Dimensional):
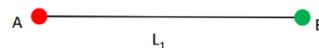

Time, on the other hand, is to be understood as an angular measure between three points (ABC) in space.
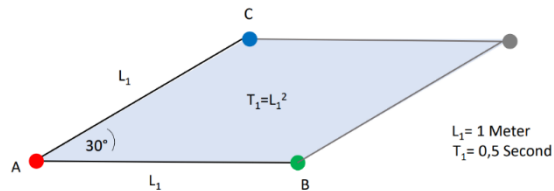
Dimension Time (3 Dimensional):

At this point, one can already see the necessity of at least a 4-dimensional space-time (Einstein), which can ultimately only represent one of the three planes of 12-dimensional space-time.

While the measure of length can occupy a range of values of $\{-\infty.....\infty\}$ (meters), the measure of time can only assume a range of values of $\{-1....0.....1\}$ (seconds), where "0 seconds" corresponds to an angle of 0° and 1 second occupies an angle of 180°, while -1 second occupies an angle of -180°.
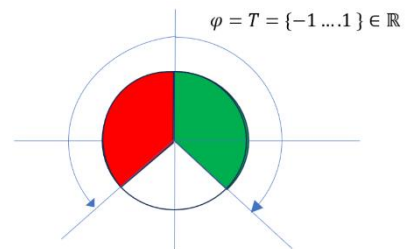
Under this premise, the number of circles is no longer an irrational number, but a rational ratio of angle to length. This becomes clear if you imagine the circle not as a static object, but as a movement. If you rotate a volumeless die, i.e. a distance between points a and b, 180° around the center of this distance, you describe a circular area.

In his work, the author has worked out as a central element of the world formula that the ratio of circumference to the diameter of a circle must be regarded as a dimensionally charged "natural constant", and that this is also the only natural constant at all.

$$\pi \;=\; \frac{Circumference}{Diameter} \;=\; \frac{T}{L} \;=\; 1\;\frac{Second}{Meter} \;=\; only\ \ natural\ constant \qquad (1)$$

All natural constants and laws of nature are therefore derived from the relationships known to us: circumference / circle diameter = π, circle circumference / circle radius = $2\,\pi$, circle area = π circle radius^2 and spherical volume = 4/3 π circle radius^3. The "problem of time" in quantum

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gravity is thus solved. Both the layman and the scientist are offered a simple and logical explanation, which is also easy to convey also to the layman.

What is time in physics?   *The angle angel between two distances L_1 and L_2*
What is the speed of light?   *A right angle (1/4 circle)*
What is a right angle ?   *4 circles (4D) with identical diameter are needed to construct a right angle (1/4 circle) in geometry*
What is space and time ?   *3 right angles, that means 3 times 4 circles = 12 Circles (12 Dimensions) are needed to create a coordinate System with units for measurement in order to measure and judge time durations and distance-lengths of the stars in the sky and the atoms we are made of.*

2 Fundamental definitions of dimensions space and time in detail

Summary: Fundamental definitions of dimensions "space and time", "speed of light" and "arrow of time" with the world formula:

Dimension Length (distance in space) is the distance between the physical observer (a point on the surface of a three-dimensional solid) and a physical object (a point on the surface of a three-dimensional solid). It introduces the first dimension and must be assigned a unit of measurement and a system of units. The length is determined by a measurement process (event) between the observer and the object. The dimension is denoted here by "length" or "L" and the unit by "meter" or "m".
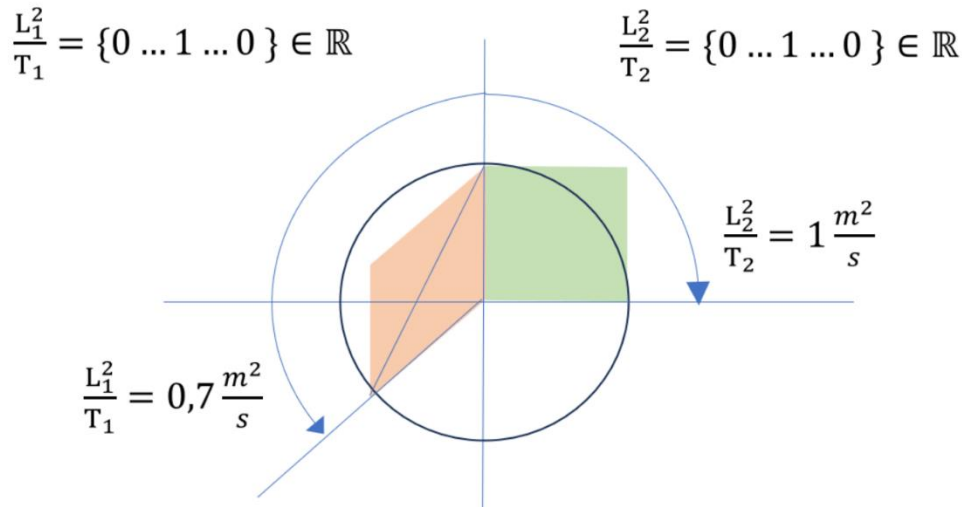
Dimension Time (time between two events in the sense of measuring a length) is the angle between the positions of the physical object relative to the physical observer that distinguishes two measurements from each other. It is the second dimension ("time", "T") that is introduced and which must be defined with a unit of measurement. The dimension is denoted here by "time" or "T" and the unit by "second" or "s". It is measured in L^2/T or T/L^2.

The speed of light is a 90 degree angle or 1/4 full angle ($\pi/2$) of the circle. In a triangle with a right angle, neither of the other two angles (masses) can reach 90° (speed of light) and always lies between 0 and 90° (speed = 0 up to max. c, "the speed of light"). The speed of light c (90° angle) is defined with $L^2/T = 1$ m^2/s

Units of measurement for time and length: The units of measurement connecting space and time are represented by the circumference of a circle $(T = 2\pi L/2)$, the area of the circle $(L^2 = \pi (L/2)^2)$ and the volume of sphere $(L^3 = 4/3 \pi (L/2)^3)$. As universal ruler we set $\pi := 1$ Second / Meter. This constant is constant over space and time in the entire universe and not depending on an inertial frame of reference.

There is **No Arrow of time**, because the circle in 12-dimensional space-time has to be divided into two halves. Starting from the line of sight $0° = (0 \cdot \pi)$, the angle can take values between $+ 180°$ (π) or $- 180°$ (-π). Thus, insofar as two time dimensions ($+ \pi$ and π) are introduced for each axis of rotation of a three-dimensional ellipsoid, no negative numbers occur. That is why there is no arrow of time in 12-dimensional space-time.

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Definition of a circle with 4 dimensions T_1, T_2. L_1 and L_2 - Measuring Time:

$$\frac{L_1^2}{T_1} = \{0 \ldots 1 \ldots 0\} \in \mathbb{R} \qquad\qquad \frac{L_2^2}{T_2} = \{0 \ldots 1 \ldots 0\} \in \mathbb{R}$$

$$\frac{L_2^2}{T_2} = 1\,\frac{m^2}{s}$$

$$\frac{L_1^2}{T_1} = 0{,}7\,\frac{m^2}{s}$$

To define Spacetime as a Volume with 3 axis of rotation, 3 Axis, that means 3 circles with each 4 Dimensions are needed. For this reason, the introduction of 12-dimensional space-time is unavoidable, because otherwise the arrow of time cannot be resolved, insofar as it is otherwise not possible to determine whether it is -1m*1m or 1m*-1m when specifying an area of magnitude -1m². In this respect, gravity (mass * mass) cannot otherwise be converted into a universally valid theory.

Already in the first publication "Solution to the problem of time" the author pointed out the fundamental two dimensions (qualities) of time that should be separated from each other, namely individual time and general time. This will now be better illustrated here:
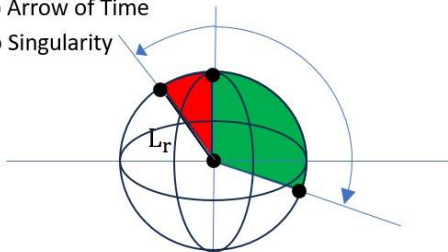
Time is a circle	Time imagined as an Archimedean Spiral
Time in 12D Spacetime	**Time in contemporary Physics**
No Quantisation	Quantisation

$$\frac{dL^2}{dT} = 1 = constant \qquad\qquad \frac{dL}{dT} = 1 = speed\ of\ light \ + \ \frac{dL^2}{dT} = \frac{T^2}{2} = constant = \pi$$

No Arrow of Time
No Singularity

Arrow of Time

$$L^2 = \frac{T^3}{6}$$

Singularity

$$L_r = \frac{1}{\sqrt{\pi}} \rightarrow$$
$$Area\ L_r^2 = \pi\,L_r^2 = 1$$

$$\varphi = T = \{-1 \ldots .1\} \in \mathbb{R}$$
$$L^2 = T = \{-1 \ldots 1\} \in \mathbb{R}$$
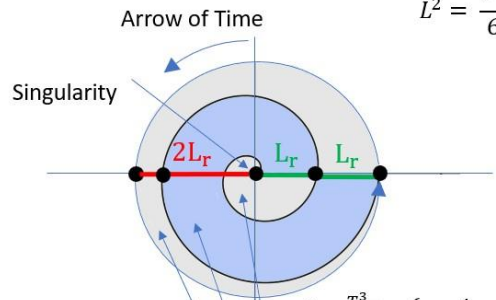
$$\varphi =$$
$$T_{GR} = \{0 \ldots .2\pi\} \in \mathbb{R}$$
$$T_{QT} = T2\pi\,\{1 \ldots .\infty\} \in \mathbb{N}$$
$$T_{GR+QT} = \{0 \ldots 2\pi \ldots \infty\}$$
$$= \mathbb{N}\ mixed\ with\ \mathbb{R}$$

$$L_{GR}{}^2 = \frac{T_{QT}^3}{6} = \left\{0 \ldots \frac{4}{3}\pi^3\right\} \in \mathbb{R}$$
$$L_{QT}{}^2 = \frac{T-1}{8\pi^3} = \{0 \ldots \infty\} \in \mathbb{N}$$
$$L_{GR+QT}{}^2 = \pi - L_{1QT}^2 - L_{2QT}^2 =$$
$$\{\pi \ldots 1 \ldots 0) = \mathbb{N}\ mixed\ with\ \mathbb{R}$$

Rational Physics without Religion	Irrational Physics (Mixed with Religion)

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While in 12-dimensional space-time time is viewed as a circular area, in contemporary physics time is currently viewed and defined as a spiritual idea of the concept of infinity (God), i.e. an "infinity" that, contrary to Einstein's suggestions, is not at all related to space. Only if one links the concept of infinity in time with the concept of infinity in space and defines this in the physical units and dimensions, can time and space be defined rationally mathematically in the sense of $\infty \, / \, \infty = \pi \, / \, \pi$.

In contemporary physics, "time" is thus defined as an open Archimedean spiral and embodies the question of meaning (principle of cause and effect) and the future, although this question must not be a question of physics, insofar as the science of physics is only concerned with measurable phenomena (Units for measurement), but not with people's "feelings" or expectations of the future.
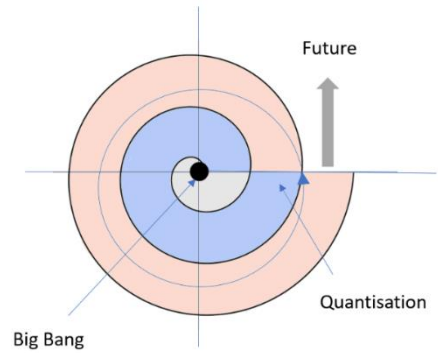
In the previous work [1,2,3..] the author has distinguished the two different concepts of time in the sense of "cause and effect", as well as in the sense of "motion" (angular measure) and has also explained a "5 dimensional" view of space-time. These connections will be outlined and clarified here once again.
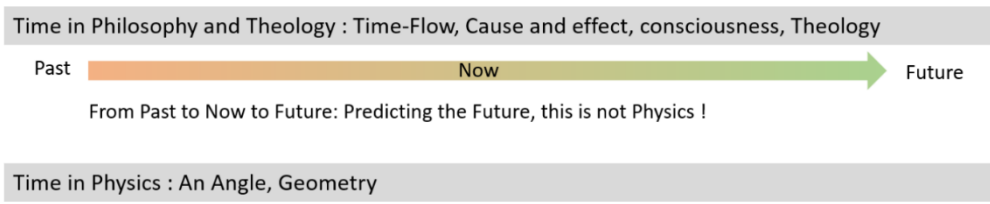
In contemporary physics, "real" time is not defined at all in the sense of a pure angle, and instead the principle of cause and effect is defined as time. As a result, there are four different interactions (B-E) in the theories of physics, which describe "forces" that actually only go back to universal time, namely the pure angular measure (A), which is not considered as a unit in contemporary physics. The four different interactions can be combined if time is correctly defined in physics, which is done by the "world formula" "circumference / diameter of the circle = time / length" elaborated here.

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Time A: The "pure" "angle" $T = L \cdot \pi$ $\left(\pi = \frac{T}{L}\right)$, that is not defined as "time" in contemporary physics, because it was missed until today, that "time" as currently defined in physics does not exist in reality, but is a imagination of the "future", which of course cannot be describe or predicted by physics.

Time B-E :   4 different ways of describing an angle which describe the 4 known interactions in physics: The electromagnetic interaction (D), gravity (C), the weak (B) and the strong interaction (E).

3 Different ways to derive the world formula "$12\,\pi\,c^3 = 1$"

3.1 Derivation from the Archimedean spiral

The presupposition of the postulate of the proportionality of distances and times (see [1] page 158 "Laws of Nature") requires that if one thinks of the advancing time (beyond a full circle) as a spiral, there must be equal spiral arm distances in equal periods of time. This condition is fulfilled by the Archimedean spiral in which the following applies: Distance from the center = Spiral arm distance times angle of rotation : L = "1" T. Where "1" represents the proportionality factor here. The increase in area in the first circumnavigation differs fundamentally from the increase in area of the second and all subsequent circumnavigations, because at the first rotation no previous area already described is described. The increase in the area in the Archimedean spiral is:

$$\frac{dL^2}{dT} = \frac{L_r{}^2}{2}T^2 \tag{2}$$

So the area at the first full rotation (we set $1 = 2\pi$) is

$$L^2 = \int_0^1 \frac{L_r^2}{2}T^2\, dT = \left[\frac{L_r^2}{6}T^3\right]_0^1 \tag{3}$$

It is precisely this increase in area that we postulate as the fundamental (only) constant of nature (a right angle) and set with $L_r^2 = 1^2$

$$1 = \frac{d}{dL}\left(\frac{T^3}{6\,L^2}\right) = \frac{T^3}{12\,L} \rightarrow 12\ L\ T^{-3} = 1 \tag{4}$$

$$with \quad L = \frac{\pi}{1}\ and\ \frac{1}{T^3} = c^3 \quad \rightarrow \quad 12\,\pi\ c^3 = 1 \tag{5}$$

3.2 Derivation from the volume of a sphere

However, the connection postulated by the author in 2019 [1]

$$natural\ constant = 1\ \frac{d}{dc}\left[\left[\frac{d}{dc}c^3\right]\pi c^2\right] = 12\,\pi c^3 = 1 \tag{6}$$

(with c =1 L/T und π =1 T/L)

could also be demonstrated with the Volume of a sphere. Let us assume that $L^3 \propto T^3$ is given with the Volume of a sphere:

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$$\left(\frac{T}{2}\right)^3 = \frac{4}{3}\,\pi\,\left(\frac{L}{2}\right)^3 \tag{7}$$

We transform to

$$1 = natural\ constant = \frac{4}{3}\,\pi\,\left(\frac{L}{T}\right)^3 \tag{8}$$

To match physical dimensions π in this equation must match $(T/L)^3$ instead of T/L. We write

$$1 = natural\ constant = \frac{4}{3}\left(\frac{T}{L}\right)^3\left(\frac{L}{T}\right)^3 \tag{9}$$

Where T/L represents "time" and L/T represents "length" in space. In order to define these constants as naturals constants over space and time we must write

$$1 = natural\ constant = \frac{d}{d\left(\frac{T}{L}\right)}\left[\frac{d}{d\left(\frac{L}{T}\right)}\left[\frac{4}{3}\left(\frac{T}{L}\right)^3\left(\frac{L}{T}\right)^3\right]\right] = 12\left(\frac{T}{L}\right)^2\left(\frac{L}{T}\right)^2 \tag{10}$$

That can be written as

$$1 = natural\ constant = 12\left(\frac{T}{L}\right)\left(\frac{L}{T}\right)^3 \tag{11}$$

And with c = L/T and $\pi = T/L$

$$1 = natural\ constant = 12\,\pi\,c^3 \tag{12}$$

3.3 Derivation from Einstein's 4D spacetime c^4

A simplified way to show this connection is to derive Einstein's 4D spacetime once after space and once after time in the form

$$natural\ constant = 1\,\frac{m}{s} = \frac{d}{dc}\left(\frac{d}{dc}c^4\right) = 12\,c^2 = 12\,\pi\,c^3 = 1 \tag{13}$$

(With c = $1/\pi$)

4 Construction of 12 D Spacetime in Detail

The following shall apply to build the necessary 12 Dimensional Spacetime. First, we set x,y and z axis in positive direction. Then we set x,y, and z axis in negative direction.

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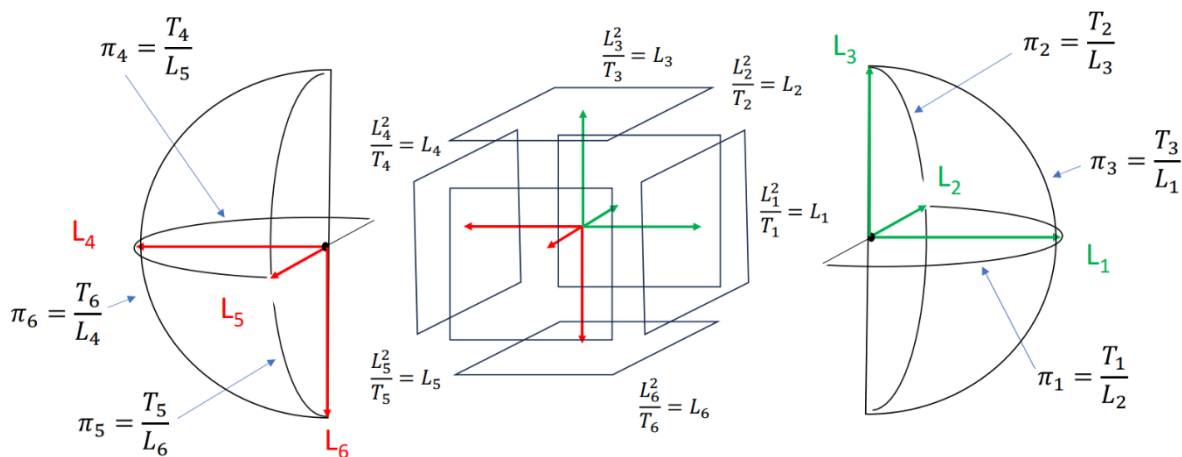
$$Distance_1 = \pi_1 = \frac{\frac{1}{2} \, Circumference}{Radius} = \frac{T_1}{L_2} \tag{14}$$

$$Area_1 = L_1^2 = \pi_1 \, L_1 L_2 = \frac{T_1}{L_2} \, L_1 L_2 \quad \rightarrow \quad \frac{L_1^2}{T_1} = L_1 \tag{15}$$

$$Volume_1 = L_1^3 = \frac{4}{3} \pi_1 \, L_1 L_2 L_3 = \frac{4}{3} \frac{T_1}{L_2} L_1 \, L_2 L_3 \quad \rightarrow \quad 3 \frac{L_1^3}{L_3 T_1} = 4 L_1 \tag{16}$$

$$Distance_2 = \pi_2 = \frac{\frac{1}{2} \, Circumference}{Radius} = \frac{T_2}{L_3} \tag{17}$$

$$Area_2 = L^2 = \pi \, L_2 L_3 = \frac{T_2}{L_3} \, L_2 L_3 \quad \rightarrow \quad \frac{L_2^2}{T_2} = L_2 \tag{18}$$

$$Volume_2 = L^3 = \frac{4}{3} \pi_2 \, L_1 L_2 L_3 = \frac{4}{3} \frac{T_2}{L_3} L_1 \, L_2 L_3 \quad \rightarrow \quad 3 \frac{L_2^3}{L_1 T_2} = 4 L_2 \tag{19}$$

$$Distance_3 = \pi_3 = \frac{\frac{1}{2} \, Circumference}{Radius} = \frac{T_3}{L_1} \tag{20}$$

$$Area_3 = L_3^2 = \pi_3 \, L_3 L_1 = \frac{T_3}{L_1} \, L_3 L_1 \quad \rightarrow \quad \frac{L_3^2}{T_3} = L_3 \tag{21}$$

$$Volume_3 = L_3^3 = \frac{4}{3} \pi_3 \, L_1 L_2 L_3 = \frac{4}{3} \frac{T_3}{L_1} L_1 \, L_2 L_3 \quad \rightarrow \quad 3 \frac{L_3^3}{L_2 T_3} = 4 L_3 \tag{22}$$

$$Distance_4 = \pi_4 = \frac{\frac{1}{2} \, Circumference}{Radius} = \frac{T_4}{L_5} \tag{23}$$

$$Area_4 = L_4^2 = \pi_4 \, L_4 L_5 = \frac{T_4}{L_5} \, L_4 L_5 \quad \rightarrow \quad \frac{L_4^2}{T_4} = L_4 \tag{24}$$

$$Volume_4 = L_4^3 = \frac{4}{3} \pi_4 \, L_4 L_5 L_6 = \frac{4}{3} \frac{T_4}{L_5} L_4 \, L_5 L_6 \quad \rightarrow \quad 3 \frac{L_4^3}{L_6 T_4} = 4 L_4 \tag{25}$$

$$Distance_5 = \pi_5 = \frac{\frac{1}{2} \, Circumference}{Radius} = \frac{T_5}{L_6} \tag{26}$$

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$$Area_5 = L_5^2 = \pi_5\, L_5 L_6 = \frac{T_5}{L_6}\, L_5 L_6 \quad \rightarrow \quad \frac{L_5^2}{T_5} = L_5 \tag{27}$$

$$Volume_5 = L_5^3 = \frac{4}{3}\, \pi_5\, L_4 L_5 L_6 = \frac{4}{3}\frac{T_5}{L_6}\, L_4\, L_5 L_6 \quad \rightarrow \quad 3\,\frac{L_5^3}{L_4\, T_5} = 4\, L_5 \tag{28}$$

$$Distance_6 = \pi_6 = \frac{\frac{1}{2}\,Circumference}{Radius} = \frac{T_6}{L_4} \tag{29}$$

$$Area_6 = L_6^2 = \pi_6\, L_4 L_6 = \frac{T_6}{L_4}\, L_4 L_6 \quad \rightarrow \quad \frac{L_6^2}{T_6} = L_6 \tag{30}$$

$$Volume_6 = L_6^3 = \frac{4}{3}\, \pi_6\, L_4 L_5 L_6 = \frac{4}{3}\frac{T_6}{L_4}\, L_4\, L_5 L_6 \quad \rightarrow \quad 3\,\frac{L_6^3}{L_5\, T_6} = 4\, L_6 \tag{31}$$

The connection between the positive and negative axes is made via

$$L_4 = -L_1\;;\; L_6 = -L_3;\; L_5 = -L_2 \tag{32}$$

The author had shown in the previous work that the plank constant is used in contemporary physics with a false dimension.

If we now take into account the reciprocal ratio of the gravitational constant (T/L) to the constant speed of light in a vacuum (L/T) in contemporary physics and the author's previous elaborations on the corrected concept of time and space, the following deviations from contemporary "erroneous" physics to a corrected physics that combines general relativity and quantum theory emerge:

Dimension of Hyperfine-Frequency of Cesium 133

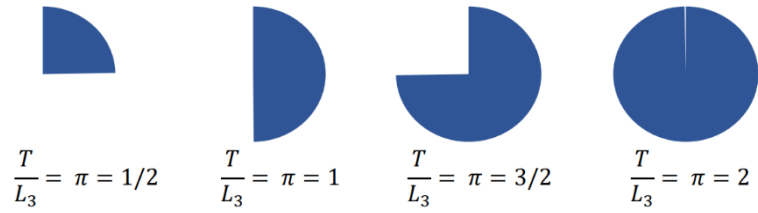| Contemporary Physics	12D corrected physics	
$f_{cs133} = T^{-1}$	$f_{cs133} = L^2 T^{-1}$	(33)

(Here, in the definition of Time via the unit "Hertz", the fundamental error on contemporary physics is manifested by definition. (See also [5] : Errors in the international System of Units). In the numerator of the fraction 1 / period T there is no dimension specified that should be related to the period length. Here the circular area must be 1 square meter, to which a period in the sense of a circular rotation / oscillation should refer. Mathematically this doesn't seem noticeable, since in mathematics because of $1^2 = 1$ this makes no difference. However, it should be taken into account here that the circle number π is "hidden" in 1^2 in the numerator of the physical unit "Hertz", insofar as a circle with a circular area of 1 meter^2 is hidden here: $1^2 = \pi$ meter^2. The time can be defined correctly via (see (3))

$$L^2 = \pi\, L^2 \rightarrow L^2 = \frac{T}{L}\, L^2 \rightarrow \frac{L^2}{T} = L \tag{34}$$

If you mistakenly assume (like Einstein) that $L^2/L = L$, i.e. ignore that this arithmetic operation is only possible under the assumption of a right angle (the speed of light), you end up with L/T = constant, which correspond to a "speed of light " as natural constant. Then, the 4D Spacetime is

$$L_1^2 = \pi\, L_2^2 \rightarrow L_1^2 = \frac{T}{L_3}\, L_2^2 \rightarrow 4\; Dimensions\; L_1, L_2, L_3, T \tag{35}$$

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which can be illustrated as

$\frac{T}{L_3} = \pi = 1/2$	$\frac{T}{L_3} = \pi = 1$	$\frac{T}{L_3} = \pi = 3/2$	$\frac{T}{L_3} = \pi = 2$

Dimension Speed of Light in Vacuum

Contemporary Physics	12D corrected Physics	
$c_{vacuum} = L\,T^{-1}$	$c_{vacuum} = L^2 T^{-1}$	(36)

Dimension of fine structure constant

Contemporary Physics	12D corrected Physics	
$\alpha = dimensionless$	$\alpha = L^{-2}T$	(37)

Dimension of Ampere

Contemporary Physics	12D corrected Physics	
$I = I$	$I = L^{-2}T$	(38)

Dimension of Mass

Contemporary Physics	12D corrected Physics	
$M = M$	$M = L^4 T^{-3}$	(39)

Dimension of Gravitational Constant G

Contemporary Physics	12D corrected Physics	
$G = L^3 M^{-1} T^{-2}$	$G = T\,L^{-1}$	(40)

Dimension of Planck Constant

Contemporary Physics	12D corrected Physics	
$h = L^6 T^{-4}$	$h = T^4 L^{-4}$ (GR)	(41)
	$h = T^{-4} L^4$ (QT)	

5 Derivation of the fine-structure-constant from 12 dimensions

From [10] equation 17:

$$\pi = 12^2 \left(\frac{10^5\, f_{cs}}{c\, R_\infty}\right)^3 \tag{42}$$

With $R_\infty = \frac{\alpha}{4\,\pi\,a_0}$ (α = fine-structure-constant; a_0 = Bohr Radius) we get

$$\pi = 12^2 \left(\frac{4\,\pi\,10^5\,a_0\,f_{cs}}{c\,\alpha}\right)^3 \tag{43}$$

$$(12\,\pi)^2 \left(\frac{4\cdot10^5}{\alpha}\right)^3 = \left(\frac{c}{a_0\,f_{cs}}\right)^3 \tag{44}$$

With (see [10]) Diameter_Earth^2 · Frequency Earth / $2\,\pi$ = c

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$$(12\,\pi)^2\ (8\cdot10^5\cdot\pi)^3\ = \left(\frac{f\,earth_{Equator}}{f_{cs}}\cdot\frac{\alpha}{a_0}\cdot Diameter^2_{Earth_{Equator}}\right)^3 \tag{45}$$

$$12^2\cdot10^2\cdot6\cdot\frac{4^2\cdot2^3}{6}\cdot\frac{4\cdot10^7}{\pi}\cdot\pi^6\cdot10^6\left(\frac{f_{cs}\cdot a_0}{f\,earth_{Equator}\cdot Diameter^2_{Earth_{Equator}}}\right)^3 = \alpha^3 \tag{46}$$

With T_{earth} = 24 h 60 Minutes 60 seconds = 86400 = $10^2\cdot12^2\cdot6$ = 1/$f_{earth\text{-}poles}$ and with Diameter$_{Earth\text{-}poles}$ = $4\cdot10^7/\pi$ (defined 1793 at the Meter – Convention in Paris) we get

$$\frac{1}{3}\frac{Diameter_{Earth_{poles}}}{f_{Earth_{poles}}}\cdot4^3\cdot\pi^6\cdot10^6\left(\frac{f_{cs}}{f\,earth_{Equator}}\cdot\frac{a_0}{Diameter^2_{Earth_{Equator}}}\right)^3 = \alpha^3 \tag{47}$$

^1/3 it becomes

$$4\pi\cdot\pi\,10^2\cdot\sqrt[3]{\frac{1}{3}\cdot\frac{Diameter_{Earth_{poles}}}{f_{Earth_{poles}}}}\frac{f_{cs}}{f\,earth_{Equator}}\cdot\frac{a_0}{Diameter^2_{Earth_{Equator}}} = \alpha \tag{48}$$

With $\pi\,10^2 = \frac{k_b e}{G\,\hbar}$ (see [10] equation 10) we write

$$4\pi\cdot\frac{k_b e}{G\,\hbar}\sqrt[3]{\frac{1}{3}\cdot\frac{Diameter_{Earth_{poles}}}{frequency_{Earth_{poles}}}}\frac{frequency_{cs133}}{frequency_{earth_{Equator}}}\cdot\frac{a_0}{Diameter^2_{Earth_{Equator}}} = \alpha \tag{49}$$

In dimensional Analysis it is written

$$4\pi\cdot\frac{\frac{T^3T^2}{L^3L^2}}{\frac{T\,T^4}{L\,L^4}}\sqrt[3]{\frac{1}{3}\cdot\frac{\frac{L}{\frac{1}{T}}}{\frac{1}{\frac{1}{T}}}\cdot\frac{\frac{1}{T}}{\frac{1}{T}}\cdot\frac{L}{L^2}}=1\quad\rightarrow\quad 4\pi\ \frac{1}{3^{\frac{1}{3}}}\cdot\frac{L^{\frac{1}{3}}}{\frac{1}{T^{\frac{1}{3}}}}\ \frac{L}{L^2}=1 \tag{50}$$

$$\rightarrow\quad\frac{1}{3}(4\pi)^3\ L\ T\ \frac{L^3}{L^6}=1^3\qquad\rightarrow\qquad\left(\frac{4\pi}{3^{\frac{1}{3}}}\right)^3\frac{T}{L^2}=1^3 \tag{51}$$

$$\left(\frac{4\pi}{3^{\frac{1}{3}}}\right)^3\frac{T}{L^2}=\text{ fine-structure-constant} \tag{52}$$

We see that the fine-structure-constant proves and embodies the basic property of 12-dimensional space-time postulated by the author ($\frac{L_1^2}{T_1}=L_1;\frac{L_2^2}{T_2}=L_2;\frac{L_3^2}{T_3}=L_3$ .. etc. see (2) – (19)). Since the value of the fine-structure constant indicates the strength of the electromagnetic interaction, the result here, namely that this constant exists in the 12D space-time in the dimension "electric current", makes logical sense. Now let's insert the numerical values:

$$4\pi\cdot\frac{k_b\cdot e}{G\cdot\hbar}\sqrt[3]{\frac{1}{3}\cdot\frac{D_{E-P}}{f_{E-P}}}\cdot\frac{f_{cs133}}{f_{E-E}}\cdot\frac{a_0}{D^2_{E-E}}=\alpha \tag{53}$$

12 Dimensions - 12 Parameters :

a_0 = Bohr Radius =   5.29177210903(80)e-11 Meter (CODATA 2018) (rel. uncertainty: 1.5e-10)
α = fine-structure–constant =   7.2973525693(11)e-3 Second/Meter^2 (CODATA 2018) (rel.uncertainty:1.5e-10)
k_b = Boltzman-Constant =   1.380649e-23 Second^3/Meter^3 (SI – Exact)
e = Elementary Charge =   1.602176634e-19 Second^2/Meter^2 (SI – Exact)
$\hbar$ = Reduced Planck Constant =   6.62607015e-34/2π Second^4/Meter^4 (SI - Exact)

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G = Gravitational Constant = 6.67430(15)e-11 Second/Meter (rel. uncertainty: 2.2e-5)

f_{cs133} = Hf frequency CS$_{133}$ = 9192631770 second^{-1} (SI - Exact)

D_{E-P} = Diameter Earth Poles WGS 84 Ellipsoid : 12713504,63 Meter

D_{E-E} = Diameter Earth Equator = WGS 84 Ellipsoid : 12756274 Meter

F_{E-P} = Frequency Earth Poles = 1 / (24 h · 60 m · 60 s) second^{-1} , defined 1793 at nat. Convention Paris

F_{E-E} = Frequency Earth Equator = 1 / 86400 second^{-1} defined 1793 at nat. Convent. Paris with definition of meter

π = Circumference / Diameter = 3,141592654…. (no dimension)

The error in the above equation is 1,82e-5 in respect to the Diameter of Earth Equator given from WGS 84 Ellipsoid. Because of the inaccuracy of the earth's surface (mountains, seas), the error value seems very acceptable. The error is below the uncertainty of Gravitational constant.

6 Proof of postulate $12\pi c^3 = 1$ with 3 Natural Constants $(L/T)^3$

In 2019, the author postulated for the 12 D Spacetime the equation (see [1])

$$12 \, \pi \, c^3 = 1 \qquad (54)$$

(with pi = Time / Length and c = Length / Time). We write:

$$12 = \pi^{-1} \cdot c^{-3} \qquad (55)$$

We can form here with equation (28) the equation

$$12 = \left(\frac{2 \cdot f_{E-D}}{D_{E-D}}\right)^{-1} \cdot \left(\frac{c \cdot R_\infty}{10^2 \cdot f_{cs133}}\right)^{-3} \qquad (56)$$

with

R_∞ = Rydberg Constant = 1,097373156816 2e+07 Meter^{-1} (rel. uncertainty: 1.9e-12)

The most exact **measured** natural constant for Dimension "Length"

c = Speed of light in vacuum = 2,9979245800e+08 Meter/Second (SI - Exact)

The arbitrarily (exactly) **defined** 2nd unit for the dimension "Length"

f_{cs133} = Hf frequency CS$_{133}$ = 9192631770 second^{-1} (SI - Exact)

The arbitrarily (exactly) **defined** 2nd unit for the dimension "Time"

D_{E-D} = Diameter Earth Defined = 4·10^7/π as dimensionless number for diameter (def. 1793 at Convent. Paris)

The arbitrarily (exactly) **defined** 1st unit for dimension "Length"

F_{E-D} = Frequency Earth Poles = 1 / (24 h · 60 m · 60 s) as dimensionless number for Circumference

The arbitrarily (exactly) **defined** 1st unit for dimension "Time"

The error in the above equation (1,636e-5) is below the uncertainty of Gravitational constant (rel. uncertainty: 2.2e-5), which in this equation is "π"; $\pi = \frac{Time}{Length} = dimension\ of\ gravitational\ constant\ G$

This equation makes it clear that in the system of units of contemporary "faulty" physics, two time scales are defined, each with two length scales, (Einsteins 4D) which lead to two theories (quantum theory and general relativity) that are therefore by definition incompatible.

7 Dissolution of the international SI unit system with the world formula

World Formula $\qquad 12 = \pi^{-1} \cdot c^{-3} \qquad (57)$

With $10^2 = \frac{k_b e}{\pi G \hbar}$ (see [10] equation 10) we write

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$$12 = \left(\frac{1}{Period_{Earth} \cdot Diameter_{Earth}}\right)^{-1} \cdot \left(\frac{\sqrt[3]{2}\,\pi \cdot G \cdot \hbar \cdot c \cdot R_\infty}{e \cdot k_b \cdot f_{cs133}}\right)^{-3} \tag{58}$$

With 7 constants for 7 Base SI Units (3D->4D)

k_b = Boltzman-Constant =	1.380649e-23 Second^3/Meter^3 (SI – Exact)
e = Elementary Charge =	1.602176634e-19 Second^2/Meter^2 (SI – Exact)
$\hbar$ = Reduced Planck Constant =	6.62607015e-34/2π Second^4/Meter^4 (SI - Exact)
c = Speed of light in vacuum =	2,9979245800e+08 Meter/Second (SI - Exact)
f_{cs133} = Hf frequency CS$_{133}$ =	9192631770 second^{-1} (SI - Exact)
G = Gravitational Constant =	6.67430(15)e-11 Second/Meter (rel. uncertainty: 2.2e-5)
R_∞ = Rydberg Constant =	1,097373156816 2e+07 Meter^{-1} (rel. uncertainty: 1.9e-12)
Diameter$_{Earth}$=Diam. Earth Poles =	WGS 84 Ellipsoid : 12713504,63 dimensionless constant
Period$_{Earth}$ =	(24 h · 60 m · 60 s) dimensionless constant

The error in the above equation is 3,51e-4. Considering that measurements of G depending on method (Time of Swing Method vs. Angular Acceleration Feedback Method) can be showing a difference of 3e-4 including uncertainty (see [1]) and considering that G ist used in 3rd power, the expected uncertainty would be 8,9e-4. Therefore the error 3,51e-4 seems very acceptable. Because of the inaccuracy of the earth's surface (mountains, seas), the "big" uncertainty of G depending on measurement method seems very acceptable.

The equation proofs, that 7 Base SI Units (Dimensions) used in the international System of Units, represented here with 7 natural constants can be resolved to a dimensionless Number (12). $\left(\sqrt[3]{2}\,\pi\right)^3$ in the equation represents the quantum of 3D space in contemporary physics with ill defined time.

8 Conclusion

The application of the world formula (pi = time/length) proves that there seem to be no natural constants apart from the circle number pi and that the natural constants in contemporary physics are merely redundant expressions for the ratio of circumference to diameter of a circle in twelve-dimensional space-time. In further work, the natural constants of contemporary physics will have to be elucidated in detail and the dimension of mass ($M = L^4/T^3$) and the dimension of electric current ($I=T/L^2$) will have to be explained in more detail. Essentially, the following problems of contemporary physics have been worked out:

- The frequency of the cesium atom as a definition for time is defined in dimension T^{-1}, but must be defined in dimension L^2T^{-1}.
- The gravitational constant is defined in dimension $L^3M^{-1}T^{-2}$, but must be defined in dimension TL^{-1} (instead of Einstein's speed of light LT^{-1}).
- Einstein's speed of light is defined in the dimension LT^{-1}, but must be defined as "time" in the dimension L^2T^{-1} and is redundant with the frequency of the caesium

[1] Q. Li et al.: Measurements of the gravitational constant using two independent methods, Nature 559, 73 (2018); DOI: 10.1038/s41586-018-0431-5

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atom : so currently two different time scales are defined (each faulty) from which two erroneous theory structures (QT and GR) have emerged.

- The fine-structure constant is defined without dimensions, but must be defined in dimension T/L^{-2}, and reflects the erroneously defined time over the ceasium atom.
- The Planck constant is defined in dimension ML^2T^{-1}, but must be defined in dimension T^4L^{-4} (TM^{-1}).

Table of some physical Quanities in 12 D Spacetime

Quantity	Symbol	Unit	Dimension	SI
Time	t	second	T	s
Length	l	Meter	L	m
Velocity	v	m/s	T/L	m / s
Electric Current	I	Ampere	T/L^2	s / m^2
Magnetic Field Strength	H	A/m	T/L^3	s / m^3
Acceleration	a	m/s^2	L/T^2	m / s^2
Electric Charge	q	Coulomb	T^2/L^2	s^2 / m^2
Temperature	T	Kelvin (K)	L^3/T^2	m^3 / s^2
Entropy	S	J/K	L^3/T^3	m^3 / s^3
Mass	m	kilogram	L^4/T^3	m^4 / s^3
Force	N	Newton	L^5/T^5	m^5 / s^5
Energy		Joule (J)	L^6/T^5	m^6 / s^5
Power	P	Watt	L^6/T^6	m^6 / s^6
Magnetic Flux Density	B	Tesla	L^6/T^6	m^6 / s^6
Amount of Substance	n	Mole (mol)	L^6/T^6	m^6 / s^6
Luminous Intensity	L	Candela (cd)	L^6/T^6	m^6 / s^6
Permeability	μ_s	H/m	L^7/T^6	m^7 / s^6
Magnetic Flux	Φ	Weber (Wb)	L^8/T^6	m^8 / s^6
Electric Field Strength		V / m	L^7/T^7	m^7 / s^7
Electric Potential	φ	Volt	L^8/T^7	m^8 / s^7
Inductance	H	Henry	L^{10}/T^7	m^{10} / s^7
Capacitance	C	Farad	T^9/L^{10}	s^9 / m^{10}

We see that Watt, Tesla, Mole and Candela will be of same quality after the ill defined Spacetime of Einstein is corrected with the correct Definition of Space and Time.

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References and Conflict of Interest

The author declares that there are no conflicts of interest and that all his work specifically on the topic of "time" in physics (2008 – 2024)[2,3,4,5,6,7,8,9,10,11,12,13,14,15] has been created through self-funded projects and essentially refers only to the ideas of Isaac Newton and Albert Einstein.

In addition, the author has dealt with a wide variety of current works in the field of the search for a ToE : [16,17,18,19,20,21]

[2] M.U.E. Pohl (2019), „Unified Principles of Nature: Solution to the Problem of Time", Scientific God Journal Vol. 10 Nr. 3: https://scigod.com/index.php/sgj/article/view/669

[3] M.U.E. Pohl (2020), „Unified Principles of Nature II + III", Scientific God Journal Vol. 11 Nr. 1: https://scigod.com/index.php/sgj/article/view/718

[4] M.U.E. Pohl (2022), „Search for the World Formula", Scientific God Journal Vol. 13 Nr. 1: https://scigod.com/index.php/sgj/article/view/669

[5] M.U.E. Pohl (2022), „Metaphysical Basis for a Unified World View: Definition of Space and Time", Conference: International Conference Philosophical Research, Science and Literature (ICPRSL-2022) At: Hyderabad, India : https://www.researchgate.net/publication/364341292_Metaphysical_Basis_for_a_Unified_Worldview_Definition_of_Space_and_Time_1

[6] M.U.E. Pohl (2022), Errors In The International System Of Units (SI) : http://dx.doi.org/10.13140/RG.2.2.13069.00485/1

[7] M.U.E. Pohl (2023), „Causality and Arrow of Time in 12 Dimensional Space-Time" : http://dx.doi.org/10.13140/RG.2.2.18245.12003/1

[8] M.U.E. Pohl (2023), „ Measures and Units in 12-Dimensional Space-Time: Unification of Ampere and Kilogram leads to Unification of GRT and QT" : http://dx.doi.org/10.13140/RG.2.2.10149.88807

[9] M.U.E. Pohl (2023), "On the conception of "Time" in Maxwell's Equations and ill-defined unit "Ampere": http://dx.doi.org/10.13140/RG.2.2.16860.77443

[10] M.U.E. Pohl (2023), Wave-particle duality What are photons and what are particles? A simple demontration that the velocity of "photons" must be given in the unit "Meter^2/ Second" instead of "Meter / Second) : http://dx.doi.org/10.13140/RG.2.2.31420.31363

[11] M.U.E. Pohl (2023), "Unification of Electromagnetism and Gravity by Correction of ill defined Dimensions of Speed Of Light and Planck's Constant" : http://dx.doi.org/10.13140/RG.2.2.34506.54720

[12] M.U.E. Pohl (2023), "What is time? On the Construction of the World Formula - Summary and Experimental Proof": http://dx.doi.org/10.13140/RG.2.2.20673.33129

[13] M.U.E. Pohl (2024), "Steps to the World Formula… Comparison of the dimensionless ToE of S. Pellis and S. Jarvis with the dimensioned ToE of M.U.E. Pohl. Are there natural constants ? Are there physical dimensions?": http://dx.doi.org/10.13140/RG.2.2.26760.80647

[14] M.U.E. Pohl (2024), "What is Space Time? A clear solution to Einsteins puzzle." : http://dx.doi.org/10.13140/RG.2.2.14055.83361

[15] M.U.E. Pohl (2024), „No complex numbers in Physics" : http://dx.doi.org/10.13140/RG.2.2.23388.97925

[16] Jarvis, Stephen. (2023). Zero Quantum Gravity (revised). 10.13140/RG.2.2.25010.58564/3.

[17] Pellis, Stergios. (2023). Dimensionless theory of everything. SSRN Electronic Journal. 5. 111. 10.2139/ssrn.4469668.

[18] Pellis, Stergios. (2023). Unity Formulas for the Coupling Constants and the Dimensionless Physical Constants. Journal of High Energy Physics Gravitation and Cosmology. 10.4236/jhepgc.2023.91021.

[19] Jackson, Peter & Minkowski, John. (2020). QM's 'Measurement Problem', an Ontological Solution, (Superseded).

[20] Kjellman, Arne. (2020). The sign-ature of absent things.

[21] Shuster, John. (2023). "What's inside ZerO?" 'Theta Numbers' and other possibilities within an 'Evolving-O'. 10.13140/RG.2.2.27072.30726.