Steps to the World Formula:
Derivation of fine-structure-constant from 12 D Spacetime
(Apart from Pi, there are no constants of nature)

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Abstract

In previous work, the author has shown that it is not Einstein's speed of light in a vacuum that describes the relationship between space and time, but that the number of circles π as relation between Circumference and Diameter of a circle characterizes the property of space-time. Here it is shown how 12 dimensional Spacetime is constructed in detail and how the fine-structure-constant is derived from the earth rotation period and the earth circumference as the original defining “constants” for Meter and Second “invented” in 1793 with the national convention in Paris where the meter was defined as 1/4 * e-7 of the circumference of the earth through the earth's poles.

Content

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1 Summary of previous work

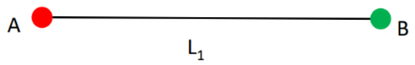
Notation:

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.

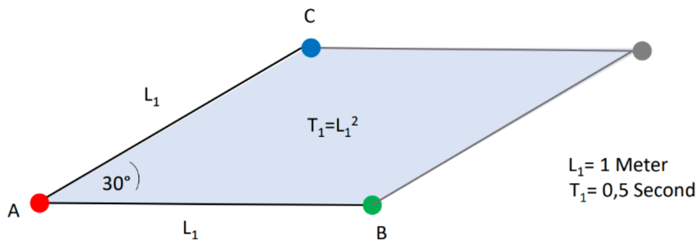
It has been shown in the author's previous work that the number of circles represents the constant relationship and connection between the dimension time and length in space. Here, the length in space is to be understood as a (straight) distance between two points (AB) in space.

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 {-∞.....∞} (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 90°, while -1 second occupies an angle of -90°.

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.

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

The Holy Grail of physics, the question of the nature of "time" and the "problem of time" in quantum gravity is thus solved. Both the layman and the scientist are offered a simple and logical explanation, which is also easy to convey to any adolescent student.

What is time?

A circle

What is the speed of light?

A right angle (1/4 circle)

What is a right angle ?

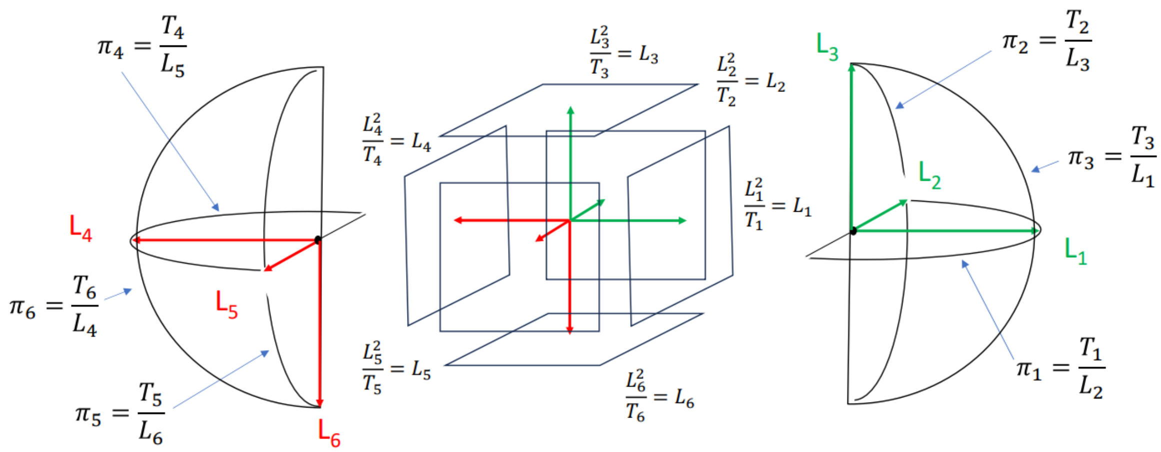
4 circels (4D) with identical diameter are needed to construct a right angle (1/4 circle) in geometry

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-lenghts of the stars in the sky and the atoms we are made of.

2 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, an z axis in negative direction.



$$Distance_1 = \pi_1 = \frac{Circumference}{Diameter} = \frac{T_1}{L_2} \tag{2}$$

$$Area_1 = L_1^2 = \pi_1 L_1 L_2 = \frac{T_1}{L_2} L_1 L_2 \rightarrow \frac{L_1^2}{T_1} = L_1 \tag{3}$$

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

$$Distance_2 = \pi_2 = \frac{Circumference}{Diameter} = \frac{T_2}{L_3} \tag{5}$$

$$Area_2 = L_2^2 = \pi_2 L_2 L_3 = \frac{T_2}{L_3} L_2 L_3 \rightarrow \frac{L_2^2}{T_2} = L_2 \tag{6}$$

$$Volume_2 = L_2^3 = \frac{4}{3}\pi_2 L_1 L_2 L_3 = \frac{4}{3}\frac{T_2}{L_3} L_1 L_2 L_3 \rightarrow 3\frac{L_2^3}{L_1 T_2} = 4 L_2 \tag{7}$$

$$Distance_3 = \pi_3 = \frac{Circumference}{Diameter} = \frac{T_3}{L_1} \tag{8}$$

$$Area_3 = L_3^2 = \pi_3 L_3 L_1 = \frac{T_3}{L_1} L_3 L_1 \rightarrow \frac{L_3^2}{T_3} = L_3 \tag{9}$$

$$Volume_3 = L_3^3 = \frac{4}{3}\pi_3 L_1 L_2 L_3 = \frac{4}{3}\frac{T_3}{L_1} L_1 L_2 L_3 \rightarrow 3\frac{L_3^3}{L_2 T_3} = 4 L_3 \tag{10}$$

$$Distance_4 = \pi_4 = \frac{Circumference}{Diameter} = \frac{T_4}{L_5} \tag{11}$$

$$Area_4 = L_4^2 = \pi_4 L_4 L_5 = \frac{T_4}{L_5} L_4 L_5 \rightarrow \frac{L_4^2}{T_4} = L_4 \tag{12}$$

$$Volume_4 = L_4^3 = \frac{4}{3}\pi_4 L_4 L_5 L_6 = \frac{4}{3}\frac{T_4}{L_5} L_4 L_5 L_6 \rightarrow 3\frac{L_4^3}{L_6 T_4} = 4 L_4 \tag{13}$$

$$Distance_5 = \pi_5 = \frac{Circumference}{Diameter} = \frac{T_5}{L_6} \tag{14}$$

$$Area_5 = L_5^2 = \pi_5 L_5 L_6 = \frac{T_5}{L_6} L_5 L_6 \rightarrow \frac{L_5^2}{T_5} = L_5 \tag{15}$$

$$Volume_5 = L_5^3 = \frac{4}{3}\pi_5 L_4 L_5 L_6 = \frac{4}{3}\frac{T_5}{L_6} L_4 L_5 L_6 \rightarrow 3\frac{L_5^3}{L_4 T_5} = 4 L_5 \tag{16}$$

$$Distance_6 = \pi_6 = \frac{Circumference}{Diameter} = \frac{T_6}{L_4} \tag{17}$$

$$Area_6 = L_6^2 = \pi_6 L_4 L_6 = \frac{T_6}{L_4} L_4 L_6 \rightarrow \frac{L_6^2}{T_6} = L_6 \tag{18}$$

$$Volume_6 = L_6^3 = \frac{4}{3}\pi_6 L_4 L_5 L_6 = \frac{4}{3}\frac{T_6}{L_4} L_4 L_5 L_6 \rightarrow 3\frac{L_6^3}{L_5 T_6} = 4 L_6 \tag{19}$$

The connection between the positive and negative axes is made via

$$L_4 = -L_1 \ ; L_6 = -L_3; \ L_5 = -L_2 \tag{20}$$

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	
$f_{cs133} = T^{-1}$	$f_{cs133} = L^2 T^{-1}$	(20)

Dimension Speed of Light in Vacuum

Contemporary Physics	12D corrected Physics	
$c_{vacuum} = L\,T^{-1}$	$c_{vacuum} = L^2 T^{-1}$	(21)

Dimension of fine structure constant

Contemporary Physics	12D corrected Physics	
$\alpha = dimensionless$	$\alpha = L^{-2}T$	(22)

Dimension of Ampere

Contemporary Physics	12D corrected Physics	
$I = I$	$I = L^{-2}T$	(23)

Dimension of Mass

Contemporary Physics	12D corrected Physics	
$M = M$	$M = L^4 T^{-3}$	(24)

Dimension of Gravitational Constant G

Contemporary Physics	12D corrected Physics	
$G = L^3 M^{-1} T^{-2}$	$G = T\,L^{-1}$	(25)

Dimension of Planck Constant

Contemporary Physics	12D corrected Physics	
$h = L^6 T^{-4}$	$h = T^4 L^{-4}$ (GR)	(26)
	$h = T^{-4} L^4$ (QT)	

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

From [10] equation 17:

$$\pi = 12^2 \left(\frac{10^5\, f_{cs}}{c\, R_\infty}\right)^3 \tag{27}$$

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

$$\pi \;=12^2\left(\frac{4\,\pi\,10^5\,a_0\,f_{cs}}{c\,\alpha}\right)^3 \tag{28}$$

$$(12\,\pi)^2\left(\frac{4\cdot10^5}{\alpha}\right)^3 \;=\left(\frac{c}{a_0\,f_{cs}}\right)^3 \tag{29}$$

With (see [10]) Diameter_Earth^2 · Frequency Earth / 2 π = c

$$(12\,\pi)^2\;(8\cdot10^5\cdot\,\pi)^3\;=\left(\frac{f_{earth_{Equator}}}{f_{cs}}\cdot\frac{\alpha}{a_0}\cdot Diameter^2_{Earth_{Equator}}\right)^3 \tag{30}$$

$$12^2\cdot10^2\cdot6\cdot\frac{4^2\cdot2^3}{6}\cdot\frac{4\cdot10^7}{\pi}\cdot\pi^6\cdot10^6\left(\frac{f_{cs}\cdot a_0}{f_{earth_{Equator}}\cdot Diameter^2_{Earth_{Equator}}}\right)^3=\alpha^3 \tag{31}$$

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

$$\frac{1}{3}\frac{Diameter_{Earth_{poles}}}{f_{Earth_{poles}}}\cdot4^3\cdot\pi^6\cdot10^6\left(\frac{f_{cs}}{f_{earth_{Equator}}}\cdot\frac{a_0}{Diameter^2_{Earth_{Equator}}}\right)^3=\alpha^3 \tag{32}$$

^1/3 it becomes

$$4\pi\;\cdot\;\pi\,10^2\cdot\sqrt[3]{\frac{1}{3}\cdot\frac{Diameter_{Earth_{poles}}}{f_{Earth_{poles}}}\frac{f_{cs}}{f_{earth_{Equator}}}\cdot\frac{a_0}{Diameter^2_{Earth_{Equator}}}}\;=\alpha \tag{33}$$

With $\pi\,10^2\;=\frac{k_b e}{G\,\hbar}$ (see [9] equation 10) we write

$$4\pi\;\cdot\frac{k_b e}{G\,\hbar}\;\sqrt[3]{\frac{1}{3}\cdot\frac{Diameter_{Earth_{poles}}}{frequency_{Earth_{poles}}}}\frac{frequency_{cs133}}{frequency_{earth_{Equator}}}\cdot\frac{a_0}{Diameter^2_{Earth_{Equator}}}=\alpha \tag{34}$$

In dimensional Analysis it is written

$$4\pi\;\cdot\frac{\frac{T^3T^2}{L^3L^2}}{\frac{T}{L}\frac{T^4}{L^4}}\;\sqrt[3]{\frac{1}{3}\cdot\frac{L}{\frac{1}{T}}\cdot\frac{\frac{1}{T}}{\frac{1}{T}}\cdot\frac{L}{L^2}}=1\quad\rightarrow\quad4\pi\;\frac{1}{3^{\frac{1}{3}}}\cdot\frac{L^{\frac{1}{3}}}{\frac{1}{T^{\frac{1}{3}}}}\;\frac{L}{L^2}=1 \tag{35}$$

$$\rightarrow\;\frac{1}{3}(4\pi)^3\,L\,T\,\frac{L^3}{L^6}=1^3\quad\rightarrow\quad\left(\frac{4\pi}{3^{\frac{1}{3}}}\right)^3\frac{T}{L^2}\;=1^3 \tag{36}$$

$$\left(\frac{4\pi}{3^{\frac{1}{3}}}\right)^3 \frac{T}{L^2} \; = \text{ fine-structure-constant} \qquad (37)$$

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:

$$4\pi \cdot \frac{k_b \,.\, e}{G \cdot \hbar} \sqrt[3]{\frac{1}{3} \cdot \frac{D_{E-P}}{f_{E-P}} \cdot \frac{f_{cs133}}{f_{E-E}} \cdot \frac{a_0}{D_{E-E}^2}} = \alpha \qquad (38)$$

12 Dimensions - 12 Parameters :

a0 = 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)
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-P} = Diameter Earth Equator =	equator with WGS 84 = 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.

4 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 caesium 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 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

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.

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)[1],[2],[3],[4],[5],[6],[7],[8],[9],[10],[11],[12],[13],[14] has been created through self-funded projects and essentially refers only to the ideas of Isaac Newton and Albert Einstein.

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