

# Unification of Electromagnetism and Gravity by correction of Einstein's ill defined speed of light „God doesn't play dice“

Manfred U. E. Pohl\*

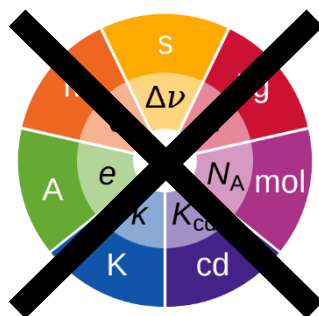
Version 1.0

26.07.2023

## Abstract

So far,<sup>12</sup> it has been worked out that the circle number connects space and time and the speed of light in vacuum only represents the Diameter of planet earth and the rotation duration of one revolution of planet earth around its own axis (a day), because in 1793 the “meter” of length in space was defined to represent the circumference of planet earth, while the “second” of time was defined to represent 24 hours 60 minutes and 60 seconds (a day). The author tries to explain here how, on the basis of these findings, the system of units would have to be reformed in order to complete the connection found by Einstein and thus dissolve all natural constants (which only represent planet Earth) and to understand gravitation and electromagnetism as a unified interaction and to reinterpret quantum theory: God does not play dice.

$$1 = 12^2 \cdot 10^{-25} \cdot G \cdot \hbar / k_B / e \cdot f_{CS}^3 / c^3 / R_{\infty}^3$$



\* Correspondence: Manfred U. E. Pohl, Independent Researcher, Germany, email: mue@villa2060.org

<sup>1</sup> Pohl M.U.E (2022): Search for the World Formula, Scientific God Journal Vol 13 No1, <https://scigod.com/index.php/sgj/article/view/781>

<sup>2</sup> Pohl M.U.E (2019): Unified Principles of Nature, Scientific God Journal Vol 10 No3, <https://scigod.com/index.php/sgj/article/view/669>

Today, the unit (second) for the Dimension time (T) is defined with the constant Hyperfine-Frequency of the Caesium<sub>133</sub> Atom. (Dimensions T for time, L for length and M for Mass, Units s for second, m for meter and kg for kilogramm)

$$T \quad f_{cs} = constant = \frac{9192631770}{1 s} = \frac{1}{T} \quad (1)$$

The unit for Length is defined based on the idea of the constant speed of light in Vacuum c.

$$L \quad c = constant = \frac{299792458 m}{1 s} = \frac{L}{T} \quad (2)$$

The unit for mass is defined based on the Planck's constant h.

$$M \quad h = constant = 6,62607015 \cdot 10^{-34} \frac{kg m^2}{s} = \frac{M L^2}{T} \quad (3)$$

We find that the foundation of physics, and thus of all contemporary science, is built on an inadmissible illusion that nature is based on a progressive time [0...∞], which in its origin has no relation or connection with space.

By definition of the units, the Big Bang (the concept of "zero") and a black hole (the concept ∞) are introduced, although this premise is inadmissible, because no experiment is conceivable that could refute the existence of these concepts.

Albert Einstein also showed with his unrefuted theories that space and time are connected, and therefore time without space cannot be defined at all. The most important consequence of Einstein's discoveries at the present time has simply never been implemented so far: the definition of time must be changed with this knowledge.

To do this, we detach the connection of the causality principle from time and remove the "arrow of time". Above (123) we see that the definition of base units represents a causal chain: time is the cause of space and space is then the cause of mass (matter). If we separate the idea of the causal principle (yesterday is the cause of tomorrow) from time and look at time purely from a metrological point of view, then time represents only an angular measure. In nature, there is only one natural constant ( $\pi$  as a symbol for a full circle) and two dimensions: the length between two places AB and the angle between two stretches AB and BC. The angle is what we call "time". This can take values from 0 to 1 (0 to 360 degrees). We call the "diameter" of a circle "length". This can take values from 0 to ∞.

Currently, it is simply assumed that a square meter of area can be represented as, for example, "1 m<sup>2</sup>" and that this physically represents an area in the dimension L<sup>2</sup>.

Originally, the kilogram, i.e. the mass, was defined as a volume (m<sup>3</sup>), namely as 1 liter of water. In this respect, the "trinity" of the "measuring kit" today consists of the definition of volume L<sup>3</sup>, time T and length L. However, the definition for the area L<sup>2</sup> is missing.

If you multiply two lengths, i.e. form a square  $L^2$ , you assume – without saying it, but assume that these lengths are at right angles to each other. If I multiply 1 meter by 1 meter, I get  $1\text{ m}^2$  as an area size, but only if the two stretches are at a right ( $90^\circ$  angle). If the two sections are at a  $45^\circ$  angle, the multiplication of 1 meter by 1 meter results an smaller area and at an  $0^\circ$  angle 1 meter \* 1 meter results in  $0\text{ m}^2$ .

In other words, space (lengths) and angles (time) are geometrically connected in such a way that a time specification must always be set in relation to area specifications.

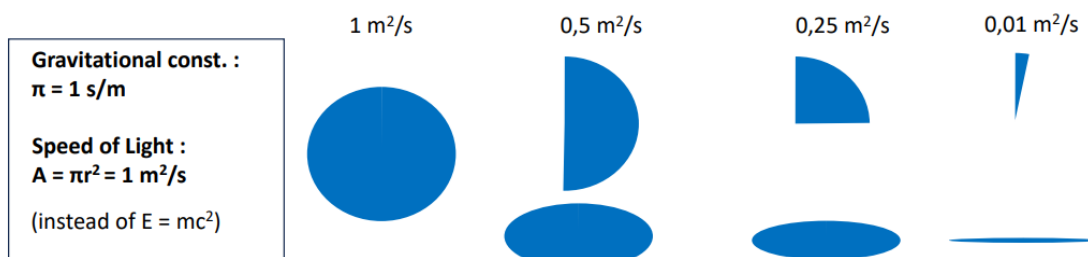
As a fundamental measure for the definition of time and space, only the image of a circle is available. This is required in geometry to construct and measure a right angle ( $90^\circ$ ). Thus, the definition of an area  $L^2$  presupposes the circle.

The circle has three "physical" properties, a circumference (represents the time dimension T), a diameter (represents the spatial dimension length L and an area  $L^2 = \pi (L/2)^2 : (\pi=4)$

Thus, instead of Einstein's fundamental relationship  $E=mc^2$ , we assume the relation  $L^2 = \pi (L/2)^2$ , a "circle" as the fundamental connection of the "observation instrument" available to us. On the other hand the Volume is defined with  $L^3 = 4/3 \pi (L/2)^3 : (\pi=2 \cdot 3)$

Thus, the essence of "time" is newly recognized as a fundamental relationship between space and time in the form that the natural constant "speed of light in a vacuum" actually describes the constant area of a circle, which can be a maximum of  $1\text{ m}^2$  or, depending on the section (if we understand the circumference as time), between 0 and  $1\text{ m}^2$ .

In order to describe this relationship, we must recognize that a time (an angle) must always be given in relation to a surface, because an angle always presupposes that two distances are related.




Objects can therefore only have the "speed" between  $0\text{ m}^2/\text{s}$  and  $1\text{ m}^2/\text{s}$ . What does this mean? It means that, in principle, no object can be unaccelerated in relation to the universe, i.e. "unaccelerated" motions (m/s) are a fiction derived from the assumption of a resting frame of reference. So Einstein defined the speed of light as a kind of ether (vacuum) at rest. Correctly, however, this natural constant of the speed of light in a vacuum must have the unit  $\text{m}^2/\text{s}$  in dimension ( $L^2/T$ ).

With this knowledge, we can then understand and prove that the original definitions of the meter (based on the circumference of the earth) and the second (based on the earth's rotation) ultimately lead to the earth being "defined" as an absolute resting point or reference system. Thus, the "speed of light" represents the Earth's own rotation. In other words, we have defined the diameter of the Earth as the "natural constant" and the rotation period of the Earth as well, although of course it is not possible to verify whether these values are actually "constant". But somewhere we have to define a "relative" benchmark.

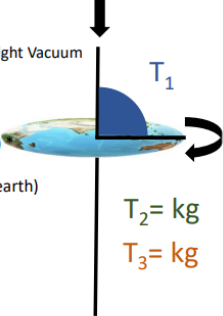
**Experimental proof: Speed of light is represented by rotation of earth**

Einstein  
4 D  
Space  
curved



↓

$c_{\text{Speed of Light Vacuum}}$   
 $\frac{m^2}{s}$   
m/s  
(Speed of rotation)  
m  
(diameter earth)  
= constant



$T_1$

$T_2 = \text{kg}$

$T_3 = \text{kg}$

As the definition of second was made original based on rotation of earth around own axis and the meter was defined original based on the circumference of earth, the speed of light represents the earth Diameter (meter) and the earth rotational speed (Second)

Speed of Light in  $m^2/s$

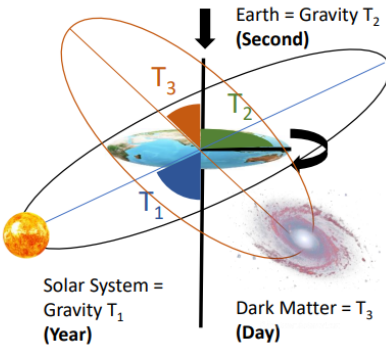
**= Diameter of earth<sup>2</sup> / (2 π · Day of earth)**  
 = (12756274 Meter)<sup>2</sup> / (2 π · 24 · 60 · 60 Seconds)  
 = 299746463 Meter<sup>2</sup>/s (WGS 84 Equator)

Error calculation:

$$\frac{c_{WGS84}}{c_{Codata}} \cdot \frac{\text{radius}_{WGS84}}{\text{radius}_{Bessel}} = \frac{299746463 \frac{m}{s}}{299792458 \frac{m}{s}} \cdot \frac{6378137m}{6377397m} = 3,74 \cdot 10^{-5} \text{ error}$$

The error is near the uncertainty of the gravitational constant G [ $\text{kg}^{-1} \text{m}^3/\text{s}^2$ ] with  $2,2 \cdot 10^{-5}$ .

6D  $L^3T^3$  Space-Time  
Gravity and Dark Matter



Earth = Gravity  $T_2$  (Second)

Solar System = Gravity  $T_1$  (Year)

Dark Matter =  $T_3$  (Day)

According to the principle of relativity, we cannot distinguish between the two different statements "The universe is expanding" and "The earth is shrinking".

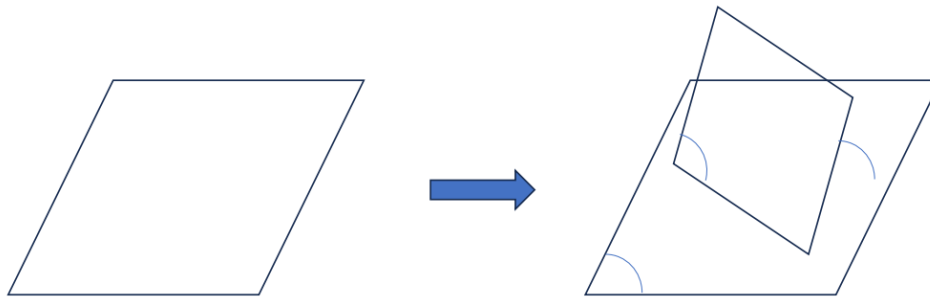
In order to correct the error in the system of units, the speed of light (diameter of the earth) must be defined in the unit  $m^2/s$  instead of in the unit  $m/s$ . The Earth's rotation as the hyperfine frequency of the cesium atom must also be defined in the unit  $m^2/s$  instead of the unit  $1/s$ . As a result, the reference value mass (kg) is omitted and becomes superfluous.

We apply the corrections in the units to the current Definitions for time and space:

$$T \quad f_{cs} = \text{constant} = \frac{9192631770 \text{ m}^2}{1 \text{ s}} = \frac{L^2}{T_1} \quad (4)$$

$$L \quad c = \text{constant} = \frac{299792458 \text{ m}^2}{1 \text{ s}} = \frac{L^2}{T_2} \quad (5)$$

Now, to define a three-dimensional space, we need the two planes, each of which has a different time dimension ( $T_1$  and  $T_2$ ) with respect to the definition of a surface, and we get the six-dimensional space  $L_1^2 L_2^2 / (T_1 T_2)$ :



We see that two time dimensions (the two angles that define and span the two areas) then create a third time dimension (the angle between the two planes). In total, the space consists of 5 dimensions ( $L_1 L_2 L_3 T_1 T_2$ ) with regard to the measurement of forces (a relation of  $L/T$ ), while the sixth dimension  $T_3$  (the one-dimensional measurement result) represents the concept of energy or information.

With the knowledge of the errors in the dimensional design of the system of units, we can correct the units and dimensions of the essential natural constants:

Gravitational Constant  $G = 6,67430 \cdot 10^{-11} \frac{s}{m} ; \frac{T_1}{L_1}$  (6)

Elementary Charge  $e = 1,602176634 \cdot 10^{-19} \frac{s^2}{m^2} ; \frac{T_1^2}{L_1 L_2}$  (7)

Boltzmanns Constant  $k_B = 1,3806503 \cdot 10^{-23} \frac{s^3}{m^3} ; \frac{T_1^2 T_2}{L_1 L_2 L_3}$  (8)

Reduced Plancks Constant  $\hbar = 1,054571817 \cdot 10^{-34} \frac{s^4}{m^4} ; \frac{T_1^2 T_2 T_3}{L_1^2 L_2 L_3}$  (9)

Because we have found out that the frequency of the caesium atom and the speed of light are not natural constants, but describe the diameter of the earth and the duration of an earth's rotation around its own axis, we must no longer consider these constants as constants and calculate from these 4 natural constants, which span the 4 dimensions of the 4D space-time erroneously defined by Einstein and take into account gravitation and electrodynamics, as it were, the only Natural (dimensionless) constant, namely the circle number  $\pi$ .

$$\pi = \frac{k_b e}{10^2 G \hbar} \tag{10}$$

The Error is  $3.73 \cdot 10^{-4}$

Against this background, it can be said that the system of units as it is set up today pretends as a premise that the world is determined by chance, because "time" is defined as a random "number". From (1) it follows

$$T \quad \text{second} = \frac{1}{9192631770} \quad (11)$$

Albert Einstein, however, found that space and time must be in relationship and cannot be determined by "chance". In a letter to Max Born in December 1926, Einstein wrote <sup>3</sup>:

*"Quantum mechanics is very respectable. But an inner voice tells me that this is not yet the real Jacob. The theory provides a lot, but it hardly brings us closer to the mystery of the old. In any case, I'm convinced that he doesn't roll the dice."*

Now we see that Albert Einstein is right, and the Copenhagen interpretation of quantum mechanics is not a valid interpretation of the laws of nature, according to which there can be no coincidence.

In 2019, the author postulated

$$12 \pi c^3 = 1 \quad (12)$$

as „Unified Principles of Nature“ <sup>4</sup>. This can now be more precisely defined here as the definition of a 6-dimensional unit cube "space-time".

$$\pi_{cube} \cdot \frac{L_1 L_2}{T_1} \cdot 2 \pi \frac{L_3}{T_2 T_3} = 1 \frac{meter^3}{second^3} \quad (13)$$

While the  $\pi$  introduces the one-dimensional ratio  $\pi = \text{second} / \text{meter}$  as the only natural constant as a circumference  $2\pi L_3$ , the "6" is derived from the spherical volume:

$$L^3 = \frac{4}{3} \pi_{cube} \left(\frac{L}{2}\right)^3 \rightarrow 6 = \pi_{cube} \quad (14)$$

And thus

$$12 \pi \left(\frac{L}{T}\right)^3 = 1 \frac{meter^3}{second^3} \quad (15)$$

In order to prove that this definition of six-dimensional space-time is correct and must be "mandatorily" introduced into science, we insert into this equation the speed of light in a vacuum (as a representation of the Earth's rotation period and the Earth's diameter), as well as the Rydberg constant  $R_\infty$  as representation of the dimensionless fine-structure-constant (representing the strength of the electromagnetism) but with dimension  $\text{Meter}^{-1}$  and the hyperfine frequency of the caesium atom  $f_{cs}$  to bring in the experimentally found relationships between space and time. Thus, we set the ratio "arbitrarily" defined on the basis of the properties of planet Earth "meter / second" (speed of light in a vacuum ; Earth's

<sup>3</sup> Albert Einstein, Hedwig und Max Born: *Briefwechsel 1916–1955*. Rowohlt Taschenbuchverlag, Reinbek bei Hamburg, 1972, S. 97f, [online uni würzburg](#)

<sup>4</sup> Pohl M.U.E (2019): Unified Principles of Nature, Scientific God Journal Vol 10 No3, <https://scigod.com/index.php/sgj/article/view/669>

diameter<sup>2</sup> / Earth's rotation period), which should cancel itself out against the measured meter/second ratio in the sense of  $f_{cs}/R_{\infty}$ :

$$12 \pi \left( \frac{10^9}{12} \frac{c \cdot R_{\infty}}{f_{cs}} \right)^3 = 1 \quad (16)$$

$$12 \pi \left( \frac{1}{12} \frac{29,9792458 \cdot 1,09737315681602 \text{ m} \cdot \text{m}^{-1}}{9,19263177 \text{ s} \cdot \text{s}^{-1}} \right)^3 = 1 \quad (17)$$

(error  $1,635 \cdot 10^{-5}$ )

$$\pi \frac{10^{27}}{144} \frac{c^3 \cdot R_{\infty}^3}{f_{cs}^3} = 1 \quad (18)$$

$$12 \pi = \left( \frac{12 f_{cs}}{c R_{\infty} 10^9} \right)^3 \quad (19)$$

We can insert (10)

$$12 \frac{k_b e}{10^2 G \hbar} = \left( \frac{12 f_{cs}}{c R_{\infty} 10^9} \right)^3 \quad (20)$$

And resolve all 7 Base Units (7 natural constant)

$$1 = 12 \left( \frac{10}{12} \right)^2 \cdot \frac{G \hbar}{k_b e} \cdot \left( \frac{12 f_{cs}}{c R_{\infty} 10^9} \right)^3 \quad (21)$$

$$1 = 12^2 10^{-25} \cdot \frac{G \hbar}{k_b e} \cdot \frac{f_{cs}^3}{c^3 R_{\infty}^3} \quad (22)$$

We now see that the dimension mass (M), measured in kilograms, is in fact the counterpart of the speed of light. While the speed of light relates an area (the area of a circle or the circumference of the earth) to an angle (a time) ( $L_1 L_2 / T_1$ ) and thus represents the first three dimensions of 6-dimensional space-time, the concept of "mass" (a kilogram was originally defined as a volume of space, namely as 1 liter of water at the earth's surface) represents the missing of the other dimensions:

$$\frac{L_1 L_2}{T_1} \cdot \frac{M_1}{M_2 M_3} = 1 \quad (23)$$

## Conclusion

As a result, we find that due to the fact that time was erroneously defined as an arbitrarily chosen number, the relative 6 space-time dimensions become "7" natural constants, all of which, however, only have the circle number  $\pi$  as their content. By correcting the definition of space-time as a 6-dimensional structure  $L^3/T^3$ , the only natural constant is the circle number. In this respect, electromagnetism and gravitation are united and the planetary orbits

in the solar system can be calculated without the gravitational constant and without mass information solely on the basis of the diameters and orbital periods, i.e. the geometry of the orbits relative to each other. The problem of dark matter and black holes is also solved.  $\pi$