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Quantum Theory and General Relativity
From the Perspective of the "World Formula"

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Overview

The discussion "Search for the World Formula"[1] about a final world formula and the premises to be preceded for this (nominal definitions of space and time) is consolidated by deriving the "world formula" presented with "Unified Principles of Nature" [2] once again in its basic conception. On the basis of a fundamental critique of the common number theory and with the reconception of a "rational circle number" as a definition for the physical quantities of length L and duration T as "only" physical quantities, the theoretical buildings of general relativity and quantum theory are falsified in their basic assumptions. In the result, it is once again implied that if the world formula is taken into account, no natural constants exist or that all constants known to us can be traced back to the circle number Pi.

$$\pi = 1 \left[\frac{s}{m}\right]$$

$$\frac{d}{dc}\left[\pi c^2 \left[\frac{d}{dc} c^3\right]\right] = 1 \left[\frac{m^2}{s^2}\right]$$

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[1] 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
[2] Pohl M.U.W. (2019): Unified Principles of Nature, Scientific God Journal Vol 10 No.3,
    https://scigod.com/index.php/sgj/article/view/669

Content

1 Preliminary consideration: Irrational mathematics and "infinity"

When it happened that mathematics became independent as a largely irrational "science" or detached itself from physics cannot be fixed on a decade or century.

Numbers alone have no meaning, just as a letter in the alphabet in the context of a language of words alone has no meaning. A number does not make sense as a set unless that number refers to a physical unit of a physical quantity. For example, as expressions of the form "3 bags of rice", "5 meters room length" or "4 hours time".

If, for example, all existing bags of rice are to be divided among all existing households, a bill could be: "10 bags of rice / 5 households = 2 bags of rice / 1 household". Consequently, arithmetic operations in the sense of "1+1=2" make no sense and are irrational, because there is no difference in whether we write "1+1=1" or "1+1=15". Both expressions are "irrational" because they are not accessible to "logical thinking".

In this sense, arithmetic operations with numbers alone (addition, subtraction, multiplication, division) or equations ("1+1=2"; "4 *4 = 16") are basically irrational or represent arbitrary strings.

If numbers are to be used in a rational context, they must always be bound to a physical quantity and unit.

Physical quantity {number set}[unit]
For example:
Rice {1,2,3} [bag]
World population {1,2,3....,7500000000} [Human]
Length {1,2,3,....} [meters]

Only on the basis of such defined sets of numbers does "mathematics" make sense at all or does mathematics as a "language" reflect a rational thought.

Examples:

$3\ [bags\ rice] + 2\ [bags\ rice] = 5\ [bags\ rice]$	Rational thought
$3\ [Humans] - 2\ [Humans] = 1\ [Human]$	Rational thought
$3\ [Humans] - 2\ [Meters] = 1\ ?$	Irrational thought
$3\ [Humans] + 2\ [bags\ rice] = 5\ ?$	Irrational thought
$\dfrac{3\ [bags\ rice]}{3\ [Human]} = \dfrac{1\ [bag\ rice]}{1\ [Human]}$	Rational thought
$3\ [Humans] \cdot 2\ [bags\ rice] = 6\ ?$	Irrational thought
$3\ [Meters] \cdot 2\ [Meters] = 6\ [Meters]$	Rational thought

However, mathematics practiced today uses numbers as an abstract object that includes "counting" (of units or events), i.e. refers to the mental "activity" of counting, but not to a real physical object. A number without reference to a physical quantity, as it is commonly used today in mathematics as a "sign", could be written as a set in the form

Thoughts {1,2,3....} [number]

This gives rise to the idea of the abstract structure of infinity. For example, it is conceivable to mentally "infinitely" experience many days by "waiting and counting" or to mentally measure an "infinite" long distance by repeatedly applying a meter scale to oneself or to count "infinitely" many rice grains by mentally counting rice grains. But even if the concept of infinity as an abstract idea of the human activity of counting makes sense, it must not be applied to "physical" sets. We don't know how many days there are or are and we don't know how big the space is, but there can't be an "infinite" number of days, nor an "infinite" room.

The discussion in the philosophy of mathematics regarding potential and actual infinity can thus be concluded logically:
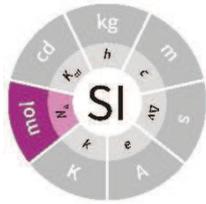If the set of the units of a physical quantity to be designated is potentially infinitely large and the numbers available for the quantity designation of the physical units are also present in infinite quantity, then a number can be found for each real present set of potentially infinitely existing units that is not "infinite".

Quantity of "rice grains" :	potentially infinite amount (not countable)
Set "Natural Numbers N" :	potentially infinite quantity (not countable)
Set "rice {1,2,3} [bag]":	finite, countable set (countable)

As already shown, arithmetic operation or mathematics with numbers alone (and with the concept of infinity) are irrational, i.e. not merely "contradictory" or incomplete, but basically not accessible to the mind at all.

In "Search fort he World-Formula"[3] it has already been shown that the definitions of space and time on which today's science is based are wrong or irrational. The physical quantity of time [second] refers only to itself and is conceived as an irrational circular definition.

Here it has also been shown that the concept of the "number" of a physical unit in the sense of a potentially infinite set of numbers does not allow rational computing operations as long as this number is not combined with a physical quantity and unit. Here, too, it should be noted that today's science is based on irrationally defined physical quantities and must therefore be considered "wrong". In addition to the definition of time, the definition of the amount of material is also a circular definition and with regard to the idea of defining a number (or the idea of counting) itself as a physical quantity is irrational, i.e. fundamentally not accessible to the mind.

The "validity" of quantum theory and general relativity is already refuted hereby. However, both theoretical buildings refute each other anyway, as they are conceptually incompatible. In this respect, the experimental confirmation of quantum theory is simultaneously falsification of general relativity and the experimental confirmation of general relativity is at the same time falsification of quantum theory. So far, it has only been explained "why" both theories are wrong: they are based on false basic assumptions about space, time and the concept of "infinity".

In the following, rational basic assumptions about space time and infinity as a "world formula" are to be explained and experimentally confirmed.

2 Foundations for rational physics and mathematics: circle, straight and PI

In "Search for the Worldformula" it was shown that the mental concepts of time and space must be defined on the basis of the mental concept of "movement" or must be thought "at the same time" with the concept of "movement".

The preliminary considerations for the concept of numbers and physical quantities are to be transferred to the concepts of circle (center M, radius r) and straight line (distance AB). A straight line is to be defined as a distance between two points in space with a distance to each other, which represents a "length" on a straight path (for example, along an acting force that turns a twine or a nylon cord into a "straight line") or can be defined as a "unit" of length in space.

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[3] 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

However, this route does not consist of a potentially "infinite" number of sections strung together. As shown, this would be an "irrational" thought. Rationally, however, this unit of length can be divided infinitely often into two equally large partial lengths. Nevertheless, even the smallest length and the largest length always remain "measurable" or "finite".

The same applies to the circle as a geometric construct. Irrational is the idea that a circle is a regular polygon (n-corner) with "infinitely" many corners. Irrational is therefore the entire mathematics, which is based on the circle number Pi as an irrational number (3,14..). If one understands a circle as a symbol of "movement", i.e. the action to rotate a distance AB by a point (A or B) in order to construct a circle, then a circle still consists only of a center (A or B) and a radius (the length of the distance AB). The circle number Pi thus represents the relationship between space and time or is the basis for the definition of space and time.

$$\pi = \frac{1\ Rotation-\ cycle\ duration\ [Second]}{1\ Diameter\ [Meter]} = 1\ \frac{[Second]}{[Meter]} \tag{1}$$

So "time" in physics is actually the angular measure with reference to a measure of length, while "space" is a measure of length with reference to an angular measure.

This can also be verified by the idea that every regular n-corner or polygon becomes a "circle" when rotated around its center by 1/n rotations.

If a regular 6-corner with the radius "1" is defined as a circle, then calculated in relation to the circumference
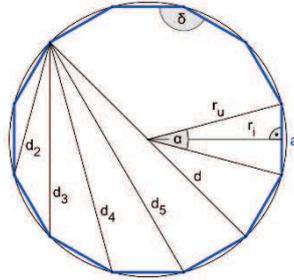
$$\pi = \frac{circumference}{diameter} \cdot \frac{1}{6} rotation = \frac{6 \cdot radius}{1 \cdot diameter} \cdot \frac{1}{6}\ rotation = 1$$
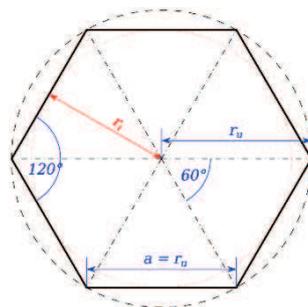
So a 6-corner becomes a circle when it rotates 1/6 rotations around its center.

With regard to the circular surface, it can be shown at the regular 12-corner with radius r that
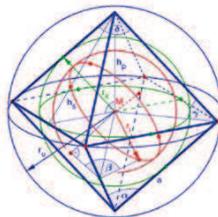
$$\pi = \frac{Area}{radius^2} \cdot \frac{1}{12} = \frac{12\ radius^2}{1\ diameter^2} \cdot \frac{1}{12} = 1$$

For a "one-corner" or for a track AB in the room where the line AB corresponds to the diameter, the following applies accordingly:

$$\pi = \frac{1\ circumference}{1\ diameter} = 1$$

The proof can also be made in three-dimensional space by understanding the octahedron (Platonic body) as a volume sphere.

Volume of the octahedron	$V = \frac{4}{3} r^3$
Volume of the sphere	$V = \frac{4}{3} \pi r^3$

$$\pi = 1$$

The "squaring of the circle" is therefore carried out via the prerequisite that a circle represents a regular n-corner, that $1/n$ is rotated (moved) around its outer circle radius.

3 Derivation of the world formula from five-dimensional space-time

In order to construct a three-dimensional space from a distance AB in space, two axes of rotation are necessary, i.e. two time dimensions (s stands for second and m stands for meter):

5-dimensional space-time : $(\pi \left[\frac{s}{m}\right], \pi \left[\frac{s}{m}\right], c \left[\frac{m}{s}\right], c \left[\frac{m}{s}\right], c \left[\frac{m}{s}\right])$

In a three-dimensional space in which time is connected to the spatial axes, but space and time are (irrationally) defined independently of each other, the ratio of space and time (speed of light in vacuum) can be determined, in which the three-dimensional space is derived twice over time and converted into a one-dimensional constant speed as a "unit of time":

$$\frac{d}{dc}\left[\frac{d}{dc}c^3\right] = 1 \left[\frac{m}{s}\right] \tag{2}$$

In order to define a unit of time [s/m] or unit of length [m/s] in five-dimensional space-time, it should be noted that the relationship made famous by Einstein $E = mc^2$ is an expression of the fact that the two time dimensions show themselves as a two-dimensional circular surface when one of the two time dimensions is converted into a length dimension, i.e. one of the two angular dimensions defining 5 dimensional space is transformed into a measure of length, so that a 4 dimensional space is created, for which a unit of time [s/m] can be specified.

$$E = mc^2 \quad \text{comparisons} \quad A = \pi c^2$$

Thus, the 5-dimensional space is to be derived twice via the space - unit of length (c =[m/s]), where $\pi = 1 \left[\frac{s}{m}\right]$ is to be understood as the time dimension that is not transformed into a spatial dimension. From

$$\frac{d}{dc}\left[\pi c^2 \left[\frac{d}{dc}c^3\right]\right] = 1 \left[\frac{m^2}{s^2}\right] \tag{3}$$

first a 4-dimensional space (c^4) and a time dimension (Pi) are created

$$\pi \frac{d}{dc}\left[3\,c^4\right] = 1 \left[\frac{m^2}{s^2}\right] \tag{4}$$

which is then transferred to a three-dimensional space.

$$12 \cdot \pi \left[\frac{s}{m}\right] \cdot c^3 \left[\frac{m^3}{s^3}\right] = 1 \left[\frac{m^2}{s^2}\right] \tag{5}$$

4 2 Measures of length are 1 too much : Rydberg constant and speed of light

Before the world formula constructed here is experimentally tested, it should be pointed out that in current science (physics) two ! Length measurements are defined. On the one hand, the length is defined by the constant speed of light in a vacuum.

$$c_{Vakuum} = 299\ 792\ 458\ [\frac{m}{s}]$$

on the other hand, the length of the room is defined by the Rydberg constant

$$R_\infty = 1.0973731568160(21) \cdot 10^7 [m^{-1}]$$

Taking into account the necessity to always understand a room length as "speed", this measure of length will be written here as speed:

$$c_r = \frac{f_{Cs133}}{R_\infty} \tag{6}$$

It should be mentioned that even this fact, which cannot be dismissed out of hand, of a room length actually defined "twice" in current science must make the basic theoretical buildings appear irrational and flawed. It is therefore not surprising that general relativity (based on the space of the speed of light) and quantum theory (based on the space of the Rydberg constant) are conceptually incompatible.

5 Experimental review of the "world formula"

In order to experimentally test this "world formula" constructed on the rational and thus only permissible definition of space and time, it is necessary to take into account the fact that in current science "two" measures of length are used, here called c_{vacuum} and c_r . For experimental verification, the world formula must be transferred to the "irrational" mathematics as applied by science today. From the world formula

$$12\ \cdot \pi\ [\frac{s}{m}] \cdot\ c^3 [\frac{m^3}{s^3}] = 1\ [\frac{m^2}{s^2}] \tag{7}$$

results by applying the irrational circle number (3,14..)

$$c_g =\ 0,29823340964655\ [\frac{m^2}{s^2}] \tag{8}$$

Then the world formula is to be aligned to the fact that two length measures c_{vacuum} and c_r flow in, whereby the time measure Pi is the speed of light in vacuum. As a correction factor, 10^{-7} is

to be applied to the speed of light, since the speed of light reflects the solid of planet Earth and its rotation around its own axis. The meter in terms of the speed of light is originally defined as 1/4 10⁻⁷ circumference of the Earth. In addition, a correction factor of 10⁻² must be applied to c g, since it is an area (10^2). Thus, the result is

$$12 \cdot \frac{10^{-7}}{c_{CODATA}} \left[\frac{s}{m}\right] \cdot c_r \left[\frac{m}{s}\right] \cdot 10^{-2} \, c_g \left[\frac{m^2}{s^2}\right] = 1 \left[\frac{m^2}{s^2}\right] \tag{9}$$

$$12 \cdot \frac{10^{-9}}{299792458} \frac{s}{m} \cdot \frac{9,19263177000E+09}{1,0973731568160200E-07} \frac{m}{s} \cdot 0,29823340964655 \frac{m^2}{s^2} \tag{10}$$

$$= 1,00000545297 \left[\frac{m^2}{s^2}\right]$$

It can therefore be shown here that the world formula can be confirmed in the experiment, i.e. using all the experiments carried out that confirm the speed of light in vacuum and the Rydberg constant, to an accuracy of 5.5 * 10⁻⁶.

6 Derivation of the speed of light

If the irrational application of the circle number Pi is replaced by a rational application of the circle number Pi in the sense of a definition of space and time ($\pi := \left[\frac{Sekunde}{Meter}\right]$), it can be shown that the speed of light in a vacuum only refers to the diameter of the earth and the rotation time of one rotation of the earth around its own axis, and therefore does not represent a "natural constant".

To prove this, the "irrational" circle circumference of a circle with a radius of the magnitude of the speed of light in a vacuum is equated with a rational circular surface in the sense of a rotating square, the radius of which is the diameter of the earth and the period duration of the rotation of this square corresponds to the period duration of one rotation of the earth around its own axis. The diameter of the Earth is to be chosen as the equator diameter, since the equator represents the rotation plane for the "time measurement".

$$2 \, \pi_{irrational} \, c_{speed\ of\ light} = \pi_{rational} \, diameter_{earth}^2 \tag{11}$$

$$c_{speed\ of\ light} = \frac{diameter_{earth}^2}{2 \, \pi \cdot cycle \, Duration_{earth\ rotation}} \tag{12}$$

$$c_{speed\ of\ light} = \frac{12756270_{earth}^2}{2 \, \pi \cdot 24 \, hours \cdot 60 \, minutes \cdot 60 \, seconds} \tag{13}$$

$$c_{speed\ of\ light} \left[\frac{m}{c}\right] = 299746275 \left[\frac{m^2}{s}\right] \tag{14}$$

(The deviation is 0.0154% from the value of the speed of light at 299792458 m/s set by CODATA (Comitee on Data for Science and Technology).)

The constant speed of light in a vacuum thus represents in reality only the constant circumference of the earth and the constantly assumed period duration of a rotation of the earth around its own axis.

7 Summary: Falsification of the existing theory building

It has been shown that on the basis of irrational mathematics, on the basis of irrational definitions of space and time and on the basis of a "double" and differently defined unit of the physical measurand "length" (in space), the foundations of general relativity and quantum theory cannot survive and these theoretical buildings must be regarded as falsified. On the other hand, a definition of space and time as a uniform "world formula" was presented and experimentally tested, which is based on a rational mathematics in which the circle number Pi does not represent an "irrational" number, but a rational relationship between the physical dimensions of time and space. As a result, it can be determined that there are no natural constants apart from the circle number Pi or that all constants can be derived from the circle number Pi.