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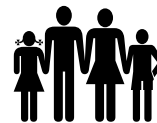
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The Cassini-Huygens mission is a cooperative project of the European Space Agency, NASA, and the Italian Space Agency. JPL.

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Ilija Brukčić
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Darkness - The negation of light.

By Ilija Barukčić*, 1, 2

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Abstract

Darkness as the negation of light is everywhere around us. But why is it there, is it the absence of everything, where does it come from? Is darkness determined somehow? This publication will prove, that the darkness is determined by light and vice versa. Light is determined by darkness. The relation between light and darkness can be derived from Einstein's field equation and the unified field equation. The relation between light and determined darkness can be expressed as

$$darkness = 1 - \left(\frac{4 * 4 * \pi * \gamma * T_{ab}}{(R * g_{ab})} \right) / \left(\frac{(R_{ab}) * (R_{ab})}{c} \right)^{1/4} \geq 0.$$

Key words: Light, Darkness, General relativity, Quantum mechanics, General Contradiction Law, Unified field equation.

1. Background

Darkness, a determinate negation, is determined by light and becomes thus illuminated darkness and vice versa. Light as such is determined by darkness and becomes thus darkened light. Illuminated darkness or darkened light have within themselves the moment of difference and are therefore determinate darkness or determinate light. Something as such can be distinguished only in determinate darkness or in determinate light. In pure, in absolute darkness there is seen just as much, and as little, as in pure or absolute light, the one is as good as the other. Pure darkness and the pure light are in so far the same. Light as such is taken as the pure positive and darkness as the pure negative. Darkness, as the pure negative, as the mere absence of light is equally self-identical and thus the positive too. It is a matter of infinite importance that in darkness there is light and in light there is darkness. Thus, light in its relation with darkness is not in relation with an other but purely in relation with its own itself. Darkness is the hidden local variable of light and vice versa. The opposition between the light and the darkness can be expressed by the general contradiction law.

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2. Material and Methods

Einstein's investigation of the relationship between energy, time and space ended in the discovery of the field equations of general relativity, which relate the presence of the curvature of spacetime and matter. Light as such is part of Einstein's field equation. It appears reasonable that the darkness can be expressed by Einstein's field equation too.

2.1. Einstein's field equation.

Einstein's theory of general relativity, especially **Einstein's field equation** describes how energy, time and space are interrelated, how the one changes into its own other and vice versa.

Einstein's basic field equation (EFE).

Let

R_{ab} denote the Ricci tensor,

R denote the Ricci scalar,

g_{ab} denote the metric tensor,

T_{ab} denote the stress-energy tensor,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$,

π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be about

$$\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510,$$

c denote the speed of all electromagnetic radiation in a vacuum, the speed of light, where

$$c = 299\ 792\ 458 [m / s],$$

γ denote Newton's gravitational 'constant', where

$$\gamma \approx (6.6742 \pm 0.0010) \cdot 10^{-11} [m^3 / (s^2 \cdot kg)],$$

Einstein's field equation describes how a field or energy (or matter) and time changes space and vice versa. Einstein's basic field equation (EFE) is usually written in the form

$$((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4) + ((R \cdot g_{ab}) / 2) = (R_{ab}). \quad (1)$$

The stress-energy-momentum tensor as the source of spacetime curvature, describes the density and flux of **energy** and momentum in spacetime in Einstein's theory of gravitation. The stress-energy-momentum tensor is the source of the gravitational field, a source of spacetime curvature.

According to general relativity, the metric of spacetime is determined by the matter and energy content of spacetime. The Ricci scalar/metric tensor completely determines the curvature of spacetime and defines such notions as **future, past**, distance, volume, angle and ...

The Ricci tensor, named after Gregorio Ricci-Curbastro, is a key term in the Einstein field equations and more or less a measure of **volume distortion**.

3. Results

3.1. The relation between pure light and pure darkness

Theorem 1. The pure light.

Let

c denote the speed of all electromagnetic radiation in a vacuum, the speed of light, where
 $c = 299\,792\,458 \text{ [m / s]}$,

$(1 - (c / c))$ denote the pure darkness,

then

$$(c / c) * (1 - (c / c)) = 0.$$

Proof.

Eq.

$$c = c \tag{2}$$

$$(c / c) = 1 \tag{3}$$

$$1 - (c / c) = 0 \tag{4}$$

$$(c / c) * 0 = 0 \tag{5}$$

$$(c / c) * (1 - (c / c)) = 0. \tag{6}$$

Q.e.d.

3.2. Identity of pure light and pure darkness

The pure light as the absence of darkness can be express by Einstein's field equation.

Theorem 2. The constancy of pure light.

Let

R_{ab} denote the Ricci tensor,

R	denote the Ricci scalar,
g_{ab}	denote the metric tensor,
T_{ab}	denote the stress-energy tensor,
h	denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$,
π	denote the mathematical constant π , also known as Archimedes' constant . The numerical value of π truncated to 50 decimal places is known to be about $\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510$,
c	denote the speed of all electromagnetic radiation in a vacuum, the speed of light, where $c = 299\ 792\ 458 [m / s]$,
γ	denote Newton's gravitational 'constant', where $\gamma \approx (6.6742 \pm 0.0010) \cdot 10^{-11} [m^3 / (s^2 \cdot kg)]$,

Einstein's field equation describes how a field or energy (or matter) and time changes space and vice versa. Einstein's basic field equation (EFE) is usually written in the form

$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) + ((R \cdot g_{ab}) / 2) = (R_{ab}).$$

Then

$$c = ((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / ((R_{ab}) - ((R \cdot g_{ab}) / 2))^{1/4}$$

Proof.

Eq.

$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) + ((R \cdot g_{ab}) / 2) = (R_{ab}) \quad (7)$$

$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) = ((R_{ab}) - ((R \cdot g_{ab}) / 2)) \quad (8)$$

Let us assume, that the division by $((R_{ab}) - ((R \cdot g_{ab}) / 2))$ is allowed and possible.

If this division is not allowed or possible, let us set $((R_{ab}) - ((R \cdot g_{ab}) / 2)) = 1$.

$$(c^4) = ((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / ((R_{ab}) - ((R \cdot g_{ab}) / 2)) \quad (9)$$

$$c = ((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / ((R_{ab}) - ((R \cdot g_{ab}) / 2))^{1/4} \quad (10)$$

Q. e. d.

The speed of the light, c , is constant, thus

$$c = ((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / ((R_{ab}) - ((R \cdot g_{ab}) / 2))^{1/4} = \text{constant}.$$

It is claimed that π and γ are constant, although there is contradiction (Barukčić 2006g) too. In this case it has to be that

$$(T_{ab}) / ((R_{ab}) - ((R \cdot g_{ab}) / 2)) = \text{constant}.$$

Let T_{ab} increase, in so far the increase of $((R_{ab}) - ((R \cdot g_{ab}) / 2))$ must happen in the same amount. Otherwise, the increase of T_{ab} could be only possible because $((R \cdot g_{ab}) / 2)$ decrease. Could this mean that energy is taken from time, that energy passes over into time and vice versa? Is the law of conservation of energy only relative and not that much absolute as thought?

3.3. Darkness - the otherness of light

Darkness as the otherness of light is determined by light and vice versa. Is it possible that light includes within itself the darkness, the other of itself and at the same time to exclude the same out of itself?

Theorem 3. Darkness - the otherness of light.

Let

R_{ab} denote the Ricci tensor,

R denote the Ricci scalar,

g_{ab} denote the metric tensor,

T_{ab} denote the stress-energy tensor,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$,

π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be about

$$\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510,$$

c denote the speed of all electromagnetic radiation in a vacuum, the speed of light, where

$$c = 299\ 792\ 458 [m / s],$$

c_d denote the determined light, where

$$c_d = (((4 \cdot 4 \cdot \pi \cdot \gamma \cdot T_{ab}) \cdot (R \cdot g_{ab})) / (R_{ab})^2)^{1/4} / c),$$

d_d denote the determined darkness,

$$d_d + c_d = 1,$$

γ denote Newton's gravitational 'constant', where

$$\gamma \approx (6.6742 \pm 0.0010) \cdot 10^{-11} [m^3 / (s^2 \cdot kg)],$$

Einstein's field equation describes how a field or energy (or matter) and time changes space and vice versa. Einstein's basic field equation (EFE) is usually written in the form

$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) + ((R \cdot g_{ab}) / 2) = (R_{ab}).$$

The unified field equations (Barukčić 2006f) is known to be

$$((4 \cdot \pi \cdot \gamma) / c^4) \cdot (T_{ab} \cdot R \cdot g_{ab}) \leq (R_{ab})^2 / 4.$$

Then darkness as the absence of light is determined by the formula

$$1 - (((4 \cdot 4 \cdot \pi \cdot \gamma \cdot T_{ab}) \cdot (R \cdot g_{ab})) / ((R_{ab}) \cdot (R_{ab}))^{1/4}) / c \geq 0.$$

Proof.

Eq.

$$(((4 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) \cdot ((R \cdot g_{ab})) \leq ((R_{ab}) \cdot (R_{ab})) / 4 \quad (11)$$

$$((4 \cdot \pi \cdot \gamma) \cdot T_{ab}) \cdot ((R \cdot g_{ab})) \leq (c^4) \cdot ((R_{ab}) \cdot (R_{ab})) / 4 \quad (12)$$

Let us assume that the division by $((R_{ab})^*(R_{ab}))$ is allowed and possible.

Otherwise, let us set $((R_{ab})^*(R_{ab})) = 1$.

$$((4 * 4 * \pi * \gamma * T_{ab})^*(R^* g_{ab})) / ((R_{ab})^*(R_{ab})) \leq (c^4) \quad (13)$$

$$(((4 * 4 * \pi * \gamma * T_{ab})^*(R^* g_{ab})) / ((R_{ab})^*(R_{ab}))^{1/4}) \leq c \quad (14)$$

$$c_d = (((4 * 4 * \pi * \gamma * T_{ab})^*(R^* g_{ab})) / ((R_{ab})^*(R_{ab}))^{1/4}) / c \leq 1 \quad (15)$$

$$d_d = 1 - (((4 * 4 * \pi * \gamma * T_{ab})^*(R^* g_{ab})) / ((R_{ab})^*(R_{ab}))^{1/4}) / c \geq 0 \quad (16)$$

Q. e. d.

4. Discussion

This publication has proved that light is not only light. Pure light is equally the absence of darkness and vice versa. Pure darkness is the absence of light. The one excludes its own other out of itself. On the other hand, the relationship between light and darkness is determined by the fact that in light there is darkness and in darkness there is light. Darkness is not the absence of all light, darkness is determined by

$$d_d = 1 - (((4 * 4 * \pi * \gamma * T_{ab})^*(R^* g_{ab})) / ((R_{ab})^*(R_{ab}))^{1/4}) / c \geq 0.$$

According to the general contradiction law it is true that

$$c_d * d_d \leq (1/4).$$

Acknowledgement

I wish to thank Albert Einstein for the basic field equation.

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Remarks.

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Anti π - Negation of Archimedes' constant π .

By Ilija Barukčić^{*,1,2}

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Abstract

Archimedes' constant π , also known as $\pi = C / d$, the ratio of a circle's circumference C to its diameter d in Euclidean geometry, appears routinely in many equations describing fundamental principles of our world, like Magnetic permeability of free space, Coulomb's law for the electric force, Einstein's field equation of general relativity, Heisenberg's uncertainty principle and so on. But even under the most optimistic conditions, it is not possible to calculate an exact value of **Archimedes' constant π** , an uncertainty in the calculation of this "constant" remains. The numerical value of π truncated to 50 decimal is about 3.14159 26535 89793 23846 26433 83279 50288 41971 69399 37510. An exact value of π is still not known. The question naturally arises, is Archimedes' constant π at the end not a constant? This publication will prove, that Archimedes' constant π is not a constant, Archimedes' constant π is changing all the time and is determined by the relationship

$$\pi * (\text{Anti } \pi) \leq (c^2) / 4.$$

Key words: Anti π , Archimedes' constant π , General relativity, General Contradiction Law.

1. Background

The numerical value of the number π has been known since ancient times. Babylonian mathematicians were using $\pi = 25/8$ about the 19th century BC. In the Egyptian Rhind Papyrus, which is dated about 1650 BC, the value of π is $\pi = 4*(8/9)*(8/9) = 3.16$. The first theoretical calculation of the value of the number π seems to have been carried out by **Archimedes** of Syracuse (Beckmann, 1971). Archimedes of Syracuse (287-212 BC) obtained the approximation $(223/71) < \pi < (22/7)$. Mathematicians have found dozens of dramatic and astonishing formulas to compute the numerical value of the number π . But it is important to realise that besides of all, no one has claimed to have discovered the exact value of π , an exact numerical value of π is still unknown. The intrinsic randomness of π is determined by the fact, that the decimal expansion of π never ends and it does not repeat. Why not, is there a cause for the intrinsic randomness of π ? Is π a mathematical constant or is π determined by a natural process?

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2. Material and Methods

There are many ways to calculate the numerical value of the number π . Nevertheless, the number π appears in Einstein's investigation of the relationship between energy, time and space too. Thus, we will use Einstein's field equations of general relativity, which relate the presence of the curvature of spacetime and matter, to investigate the true nature of the number π . In so far, our starting point to proof whether the number π is a constant or not is Einstein's field equation.

2.1. Einstein's field equation.

Einstein's theory of general relativity, especially **Einstein's field equation** describes how energy, time and space are interrelated, how the one changes into its own other and vice versa. It needs Newton's gravitational constant γ for the description of spacetime and vice versa. Newton's gravitational constant γ can be described by **Einstein's field equation**.

Einstein's basic field equation (EFE).

Let

R_{ab} denote the Ricci tensor,

R denote the Ricci scalar,

g_{ab} denote the metric tensor,

T_{ab} denote the stress-energy tensor,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$,

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$$c = 299\ 792\ 458 [m / s],$$

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$$\gamma \approx (6.6742 \pm 0.0010) \cdot 10^{-11} [m^3 / (s^2 \cdot kg)],$$

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$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) + ((R \cdot g_{ab}) / 2) = (R_{ab}). \quad (1)$$

The stress-energy-momentum tensor is known to be the source of spacetime curvature and describes more or less the density and flux of **energy** and momentum in spacetime in Einstein's theory of gravitation.

The metric of spacetime is determined by the matter and energy content of spacetime. The Ricci scalar/metric tensor completely determines the curvature of spacetime and defines such notions as **future**, **past**, distance, volume, angle and ...

The Ricci tensor, named after Gregorio Ricci-Curbastro, is a key term in the Einstein field equations and more or less a measure of **volume distortion**.

3. Results

3.1. Archimedes' constant π is not a constant

Let us assume that Archimedes' constant π is a constant. If this is true, then π can not change as such under any circumstances otherwise it would not be a constant. In so far, the stress-energy-momentum tensor T_{ab} or the Ricci scalar/metric tensor ($(R^*g_{ab})/2$) should not have any influence at all on the numerical value of the number π . On the other hand, it is equally true that especially **Einstein's field equation** doesn't work at all without Archimedes' constant π .

Theorem 1. Archimedes' constant π is not a constant.

Let

R_{ab} denote the Ricci tensor,

R denote the Ricci scalar,

g_{ab} denote the metric tensor,

T_{ab} denote the stress-energy tensor,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$,

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$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) + ((R^*g_{ab})/2)) = (R_{ab}).$$

Then

$$\pi = (c^4) \cdot ((R_{ab}) - ((R^*g_{ab})/2)) / (4 \cdot 2 \cdot \gamma \cdot T_{ab}).$$

Proof.

Eq.

$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) + ((R^*g_{ab})/2)) = (R_{ab}) \quad (2)$$

$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) = ((R_{ab}) - ((R^*g_{ab})/2)) \quad (3)$$

$$(4 \cdot 2 \cdot \pi \cdot \gamma \cdot T_{ab}) = (c^4) \cdot ((R_{ab}) - ((R^*g_{ab})/2)) \quad (4)$$

Let us assume, that a division by (T_{ab}) is allowed and possible.
 If the division by (T_{ab}) is not allowed or possible, set $(T_{ab}) = 1$.

$$\pi = (c^4) * ((R_{ab}) - ((R * g_{ab}) / 2)) / (4 * 2 * \gamma * T_{ab}) \quad (5)$$

Q. e. d.

What are the consequences of this solution of Einstein's field equation. First of all, Eq. (5) states more or less that

$$(\pi = \text{constant1}) = \text{constant2} * ((R_{ab}) - ((R * g_{ab}) / 2)) / (4 * 2 * \gamma * T_{ab}).$$

If Archimedes' constant π is nothing then a true constant, then

$$((R_{ab}) - ((R * g_{ab}) / 2)) / (4 * 2 * \gamma * T_{ab}) = \text{constant3}$$

too, since c according to Einstein is a constant. Let us set the Ricci tensor $R_{ab} = 0$, theoretically Archimedes' constant π according to Eq. (5) can survive. Let us assume that the Ricci scalar / metric tensor $((R * g_{ab}) / 2) = 0$ or vanishes, theoretically Archimedes' constant π can survive too. Contrary to this, Archimedes' constant π is not able to survive if $T_{ab} = 0$, since we are not allowed to divide by 0. Conclusion: Archimedes' constant π seems to be dependent or determined at least by the stress-energy tensor T_{ab} .

3.2. Anti π - the otherness of Archimedes' constant π

Is Archimedes' constant π something able to change and something that is changed too?

Theorem 2. Anti π - the otherness of Archimedes' constant π .

Let

R_{ab} denote the Ricci tensor,

R denote the Ricci scalar,

g_{ab} denote the metric tensor,

T_{ab} denote the stress-energy tensor,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) * 10^{-34} [J * s]$,

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Einstein's field equation describes how a field or energy (or matter) and time changes space and vice versa. Einstein's basic field equation (EFE) is usually written in the form

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / (c^4)) + ((R^* g_{ab}) / 2) = (R_{ab}).$$

The unified field equation (Barukčić 2006e) is known to be

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / (c^4)) * ((R^* g_{ab}) / 2) \leq ((R_{ab})^*(R_{ab})) / 4,$$

thus

$$\pi * (\text{Anti } \pi) \leq (c^2) / 4$$

or

$$\text{Anti } \pi \leq ((4 * \gamma * T_{ab}) * (R^* g_{ab})) / ((c^2) * ((R_{ab})^*(R_{ab}))).$$

Proof.

Eq.

$$(((4 * \pi * \gamma) * T_{ab}) / (c^4)) * ((R^* g_{ab})) \leq ((R_{ab})^*(R_{ab})) / 4 \quad (6)$$

Let us assume that the division by $((T_{ab})^*(R^* g_{ab}))$ is allowed and possible.

If the division by $((T_{ab})^*(R^* g_{ab}))$ is not allowed and possible, set $((T_{ab})^*(R^* g_{ab})) = 1$.

$$\pi \leq ((c^4 / (4 * 4)) * ((R_{ab})^*(R_{ab}))) / (((\gamma) * T_{ab}) * (R^* g_{ab})) \quad (7)$$

$$\pi \leq ((c^2 * c^2) / (4 * \gamma * 4)) * ((R_{ab})^2 / (T_{ab}) * (R^* g_{ab})) \quad (8)$$

$$\pi \leq (\text{Anti } \gamma * (c^2 / 4)) * (((R_{ab})^*(R_{ab})) / (T_{ab}) * (R^* g_{ab})) \quad (9)$$

Let us assume, that the division by $((R_{ab})^*(R_{ab}))$ is allowed and possible.

If the division by $((R_{ab})^*(R_{ab}))$ is not allowed and possible, set $((R_{ab})^*(R_{ab})) = 1$.

$$(((4 * 2 * \pi * \gamma) * T_{ab}) * (R^* g_{ab})) / (2 * (c^4) * ((R_{ab})^*(R_{ab}))) \leq 1 / 4 \quad (10)$$

$$(((4 * \pi * \gamma) * T_{ab}) * (R^* g_{ab})) / ((c^2) * ((R_{ab})^*(R_{ab}))) \leq (c^2) / 4 \quad (11)$$

$$\pi * (((4 * \gamma) * T_{ab}) * (R^* g_{ab})) / ((c^2) * ((R_{ab})^*(R_{ab}))) \leq (c^2) / 4 \quad (12)$$

$$\pi * (((T_{ab}) * (R^* g_{ab})) / ((\text{Anti } \gamma) * ((R_{ab})^*(R_{ab})))) \leq (c^2) / 4$$

According to the general contradiction law (Barukčić 2006d) $((c^2) / 4)$ is the unity and the struggle of X and Anti X. Set $\pi = X$. Thus we obtain Anti X as

$$\text{Anti } \pi \leq (((T_{ab}) * (R^* g_{ab})) / ((\text{Anti } \gamma) * ((R_{ab})^*(R_{ab})))) \quad (13)$$

$$\pi * (\text{Anti } \pi) \leq (c^2) / 4 \quad (14)$$

Q. e. d.

Anti π , the otherness of π , can be defined as $\text{Anti } \pi \leq (c^2 / (4 * \pi))$.

3.3. The unity of Euler's number e and Archimedes' constant π

Archimedes' constant π and Euler's number e are determined by each other.

Theorem 3. The unity of Archimedes' constant π and Euler's number e .

Let

e denote the mathematical constant e , also known as **Euler's constant**. The numerical value of π truncated to 20 decimal places is known to be:

$$e \approx 2.71828\ 18284\ 59045\ 23536,$$

Anti e denote the otherness of the mathematical constant e , denoted as **Anti Euler's constant**. Let the numerical value of Anti e truncated to 20 decimal places is known to be:

$$\mathbf{Anti\ } e = (\pi - e) \approx 0.423310825130748. \text{ Let us assume that } e \geq (\mathbf{Anti\ } e) . \text{ Let}$$

$$e + (\mathbf{Anti\ } e) = \pi,$$

π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be:

$$\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510.$$

$$\pi \text{ is known to be } \pi \leq (\mathbf{Anti\ } \gamma * (c^2 / 4)) * ((R_{ab})^2 / (T_{ab}) * (R^* g_{ab})),$$

then

$$e * (\mathbf{Anti\ } e) \leq (\pi^2 / 4)$$

Proof.

$$e \geq \mathbf{Anti\ } e \tag{15}$$

$$e + e \geq e + (\mathbf{Anti\ } e) \tag{16}$$

$$2e \geq \pi \tag{17}$$

$$e \geq \pi/2 \tag{18}$$

$$e - (\pi/2) \geq 0 \tag{19}$$

$$(e - (\pi/2))^2 \geq 0^2 \tag{20}$$

$$(e^2) - (e*\pi) + (\pi^2)/4 \geq 0^2 \tag{21}$$

$$(e^2) - (e*\pi) \geq -(\pi^2)/4 \tag{22}$$

Eq. (22) time (-1) yields Eq. (23).

$$-(e^2) + (e*\pi) \leq +(\pi^2)/4 \tag{23}$$

$$+(e*\pi) - (e^2) \leq +(\pi^2)/4 \tag{24}$$

$$(e) * (\pi - e) \leq (\pi^2)/4 \tag{25}$$

$$(e) * (\mathbf{Anti\ } e) \leq (\pi^2) / 4 \tag{26}$$

Q. e. d.

Based on the famous Basel problem in 1735 it is known that

$$(\pi^2/4) \approx (3/2) * (\lim_{n \rightarrow +\infty} ((1 + (1/1^2)) + (1 + (1/2^2)) + (1 + (1/3^2)) + \dots + (1 + (1/n^2)))).$$

In so far it is equally true that

$$e^*(\text{Anti } e) \leq (\pi^2)/4 \approx (3/2) * (\lim_{n \rightarrow +\infty} ((1 + (1/1^2)) + (1 + (1/2^2)) + (1 + (1/3^2)) + \dots + (1 + (1/n^2)))).$$

3.4. The "constant" (1 / (4 * π))

Theorem 4. The constant (1/(4*π)) is determined by Einstein's field equation.

Let

R_{ab} denote the Ricci tensor,

R denote the Ricci scalar,

g_{ab} denote the metric tensor,

T_{ab} denote the stress-energy tensor,

t denote the (space) time,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) * 10^{-34} [J * s]$.

π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be:

$$\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510.$$

c denote the speed of all electromagnetic radiation in a vacuum, the speed of light, where

$$c = 299\ 792\ 458 [m / s].$$

γ denote Newton's gravitational 'constant', where

$$\gamma \approx (6.6742 \pm 0.0010) * 10^{-11} [m^3 / (s^2 * kg)].$$

μ_0 denote the permeability constant, the magnetic constant, the permeability of free space or of vacuum,

ϵ_0 denote the permittivity of vacuum, the electric constant.

$$\text{Recall, } (\mu_0 * \epsilon_0 * (c^2)) = 1.$$

$$\text{Set } ((R_{ab}) - ((R * g_{ab}) / 2)) \neq 0.$$

Recall, it is known that Einstein's field equation describes how a field or energy (or matter) and time changes space and vice versa. Einstein's basic field equation (EFE) is usually written in the form

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / (c^4)) + ((R * g_{ab}) / 2) = (R_{ab}).$$

Then

$$1 / (4 * \pi) = (((2 * \gamma) * T_{ab}) / ((c^4) * ((R_{ab}) - ((R * g_{ab}) / 2)))).$$

Proof.

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / (c^4)) + ((R^* g_{ab}) / 2) = (R_{ab}) \quad (27)$$

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / (c^4)) = ((R_{ab}) - ((R^* g_{ab}) / 2)) \quad (28)$$

Let us assume that the division by $((R_{ab}) - ((R^* g_{ab}) / 2))$ is allowed and possible.

If the division by $((R_{ab}) - ((R^* g_{ab}) / 2))$ is not allowed or possible, let us

$$\text{set}((R_{ab}) - ((R^* g_{ab}) / 2)) = 1.$$

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / ((c^4) * ((R_{ab}) - ((R^* g_{ab}) / 2)))) = 1 \quad (29)$$

Recall, $(\mu_0 * \epsilon_0 * (c^2)) = 1$. Thus, we obtain Eq. (30).

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / ((c^4) * ((R_{ab}) - ((R^* g_{ab}) / 2)))) = (\mu_0 * \epsilon_0 * (c^2)) \quad (30)$$

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / ((c^6) * ((R_{ab}) - ((R^* g_{ab}) / 2)))) = (\mu_0 * \epsilon_0) \quad (31)$$

Eq. (32) follows immediately from Eq. (29).

$$(((4 * \gamma) * T_{ab}) / ((c^4) * ((R_{ab}) - ((R^* g_{ab}) / 2)))) = (1 / (2 * \pi)) \quad (32)$$

$$((((4 * \gamma) * T_{ab}) / ((c^4) * ((R_{ab}) - ((R^* g_{ab}) / 2))))^{1/2} = (1 / (2 * \pi))^{1/2} \quad (33)$$

Eq. (33) is needed for Gauss normal distribution too.

At the end, Eq. (34) follows immediately from Eq. (29).

$$(((2 * \gamma) * T_{ab}) / ((c^4) * ((R_{ab}) - ((R^* g_{ab}) / 2)))) = (1 / (4 * \pi)) \quad (34)$$

Q. e. d.

The "constant" $(1 / (4 * \pi))$ is very important and used everywhere in physics. This "constant" is determined by the basic relation between energy, time and space.

3.5. Euler's identity and Archimedes' constant π

The mathematical constant e , one of the most important numbers in mathematics, is known to be the base of the natural logarithm. The numerical value of e truncated to 20 decimal places, occasionally called **Euler's number** in honour of the Swiss mathematician Leonhard Euler (April 15, 1707 – September 18, 1783), can be calculated as

$$e \approx \lim_{n \rightarrow +\infty} (1 + (1/n))^n \approx 2.71828 18284 59045 23536.$$

The formula of **Euler's identity** is known to be defined as

$$-1 + 1 = 0, \text{ or}$$

$$\cos \pi + \sin \pi = 0, \text{ or}$$

$$e^{(i * \pi)} + 1 = 0.$$

where

- e denote Euler's number, the base of the natural logarithm,
 i denote the imaginary unit, one of the two complex numbers whose square is negative one,
 π denote Archimedes' constant, the ratio of the circumference of a circle to its diameter.

Recall, $\cos \pi = -1$ and $\sin \pi = +1$. Some people named **Euler's identity** as one of the greatest equation ever (Crease 2004). Thus, there must be a relation between **Euler's number e** and **Archimedes' constant π** and at the end between Einstein's field equation too.

Theorem 5. Euler's identity and Einstein's field equation.

Let

- R_{ab} denote the Ricci tensor,
 R denote the Ricci scalar,
 g_{ab} denote the metric tensor,
 T_{ab} denote the stress-energy tensor,
 t denote the (space) time,
 h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) * 10^{-34} [J * s]$.
 e denote the mathematical constant e, also known as **Euler's constant**. The numerical value of π truncated to 20 decimal places is known to be:
 $e \approx 2.71828\ 18284\ 59045\ 23536$,
 i denote the imaginary unit, one of the two complex numbers whose square is negative one,
 Anti e denote the otherness of the mathematical constant e, denoted as **Anti Euler's constant**. Let the numerical value of Anti e truncated to 20 decimal places is known to be:
 $\text{Anti } e = (\pi - e) \approx 0.423310825130748$,
 π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be:
 $\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510$.
 π is known to be $\pi \leq (\text{Anti } \gamma * (c^2 / 4)) * ((R_{ab})^2 / (T_{ab})) * (R * g_{ab})$,
 c denote the speed of all electromagnetic radiation in a vacuum, the speed of light, where
 $c = 299\ 792\ 458 [m / s]$.
 γ denote Newton's gravitational 'constant', where
 $\gamma \approx (6.6742 \pm 0.0010) * 10^{-11} [m^3 / (s^2 * kg)]$.

- μ_0 denote the permeability constant, the magnetic constant, the permeability of free space or of vacuum,
 ϵ_0 denote the permittivity of vacuum, the electric constant.

$$\text{Recall, } (\mu_0 * \epsilon_0 * (c^2)) = 1.$$

Einstein's field equation describes how a field or energy (or matter) and time changes space and vice versa. Einstein's basic field equation (EFE) is usually written in the form

$$(((4 * 2 * \pi * \gamma) * T_{ab}) / (c^4)) + ((R^* g_{ab}) / 2)) = (R_{ab}).$$

Then

$$e^{(i * ((\text{Anti } \gamma)^{(c*c/4)}) * ((R_{ab})^2 / ((T_{ab})^*(R^*g_{ab}))))} + (\mu_0 * \epsilon_0 * c^2) = 0.$$

Proof.

$$e^{(i * \pi)} + 1 = 0. \quad (35)$$

According to Eq. (9) $\pi \leq (\text{Anti } \gamma * (c^2 / 4)) * ((R_{ab})^2 / (T_{ab})^*(R^*g_{ab}))$.

Thus we obtain

$$e^{(i * ((\text{Anti } \gamma)^{(c*c/4)}) * ((R_{ab})^2 / ((T_{ab})^*(R^*g_{ab}))))} + 1 = 0. \quad (36)$$

$$\text{Recall, } (\mu_0 * \epsilon_0 * (c^2)) = 1.$$

$$e^{(i * ((\text{Anti } \gamma)^{(c*c/4)}) * ((R_{ab})^2 / ((T_{ab})^*(R^*g_{ab}))))} + (\mu_0 * \epsilon_0 * c^2) = 0. \quad (37)$$

Q. e. d.

The relationship between **Euler's** identity and **Einstein's** field equation has consequences. Let us assume, that George **Boole** is right, let it be true that "the respective interpretations of the symbols 0 and 1 in the system of Logic are Nothing and Universe" (Boole 1854, p. 49). In this case, 0, the nothing, "the 'black hole' of mathematics" (Barukčić 2006a, p. 56) is full of something according to Euler's identity, it is not only the empty negative, 0 has properties. The nothing according to Boole that 0 is, is a nothing that has within itself a reference to the other of itself, to something. It appears to me that out of such a nothing something can develop. Only, how can something develop out of nothing. It is true $+1 = +1$. There seems to be a perfect state of symmetry before us although the one is on the left side of a equation and the other on the right side of the same equation. Can such a state of symmetry be violated (cp violation)? Equally it is true $-1 + 1 = 0$ but the negative 1 is not dominant over the positive 1 and vice versa. Under

which conditions can the state of symmetry be violated. Is it possible that the positive 1 is dominant over the negative 1 and what are the consequences? Can Heisenberg help?

Let

$\sigma(\Delta x)$ denote the standard deviation of the uncertainty of the position measurements,

$\sigma(\Delta p)$ denote the standard deviation of the uncertainty of the momentum measurements,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$,

π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be about

$$\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510,$$

then

$$\sigma(\Delta x) \cdot \sigma(\Delta p) \geq \left(\frac{h}{4 \cdot \pi} \right). \quad (38)$$

In so far, Heisenberg's uncertainty principle is known to be something like $\sigma(\Delta x) \cdot \sigma(\Delta p) \geq (h/(4 \cdot \pi))$. The immediate consequence of Heisenberg's uncertainty principle is that $\sigma(\Delta x) \cdot \sigma(\Delta p) - (h/(4 \cdot \pi)) \geq 0$. The inequality ($a \geq b$) means that **either** ($a = b$) **or** ($a > b$) but not both at the same time, in the same respect. According to Heisenberg's uncertainty principle, both ($a = b$) **and** ($a > b$) are equally possible, allowed and true, but not in the same respect. Thus, if Heisenberg's uncertainty inequality is mathematically correct then **Heisenberg's uncertainty principle is valid in both worlds, in a world being equal to zero and in a world being greater than zero**. In so far, according to Heisenberg's uncertainty principle it is **either** ($\sigma(\Delta x) \cdot \sigma(\Delta p) - (h/(4 \cdot \pi)) = 0$) **or** ($\sigma(\Delta x) \cdot \sigma(\Delta p) - (h/(4 \cdot \pi)) > 0$). On the other hand, Heisenberg's uncertainty principle allows a world where

$$((\sigma(\Delta x) \cdot \sigma(\Delta p) - (h/(4 \cdot \pi)) = 0) \cap (\sigma(\Delta x) \cdot \sigma(\Delta p) - (h/(4 \cdot \pi)) > 0))$$

and is equally valid in both worlds. Only a world where ($\sigma(\Delta x) \cdot \sigma(\Delta p) - (h/(4 \cdot \pi)) = 0$) is quite different from a world where ($\sigma(\Delta x) \cdot \sigma(\Delta p) - (h/(4 \cdot \pi)) > 0$). Thus, Heisenberg's uncertainty relation must be valid before the "Big bang" too. Heisenberg's uncertainty principle enables equally both worlds and is full of contradictions.

Theorem 6. The world before the "Big bang" is not without laws.

Let

X denote something existing independently of human mind and consciousness that can take only the values either 0 or 1,

$\text{Anti } X$ denote the opposite, the otherness of something existing independently of human mind and consciousness that can take only the values either 0 or 1,

$$X + (\text{Anti } X) = 1,$$

$$X \cap (\text{Anti } X) = 0 \text{ (according to the law of contradiction (Barukčić 2006d, p. 8))},$$

$\sigma(\Delta x)$ denote the standard deviation of the uncertainty of the position measurements,

$\sigma(\Delta p)$ denote the standard deviation of the uncertainty of the momentum measurements,

h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$,

π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be about

$$\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510,$$

then

$$(X \cap (\text{Anti } X)) \geq \left(\frac{h}{4 * \pi} \right).$$

Proof.

$$\sigma(\Delta x) * \sigma(\Delta p) \geq \left(\frac{h}{4 * \pi} \right) \quad (39)$$

Let us assume a world without position, without movement, without space, "a world without changes" in our sense, a world where $\sigma(\Delta x) * \sigma(\Delta p) = 0$. Thus, we obtain Eq. (40).

$$0 \geq \left(\frac{h}{4 * \pi} \right) \quad (40)$$

According to the law of contradiction, it is true that $X \cap (\text{Anti } X) = 0$ (Barukčić 2006d, p. 8). We obtain Eq. (41).

$$(X \cap (\text{Anti } X)) \geq \left(\frac{h}{4 * \pi} \right) \quad (41)$$

Q. e. d.

If Eq. (40) is correct, then h or π or both cannot be constant, they must have the ability of being changed or to change or both. In so far, Heisenberg's uncertainty principle has a reference within itself to **a world equal to 0** and equally to **a world greater than 0**, Heisenberg's uncertainty principle has thus within itself a reference to local hidden and local non-hidden variables, it is a world where A and its own otherness, the $\text{Anti } X$, exist equally. In last consequence, in general, Heisenberg's uncertainty principle is thus the point in nature where the influence of 0 , the state of symmetry comes to an end and the infinity of development has to begin, where the positive defeats the negative. In so far, the condition for the "Big Bang" must be found in Heisenberg's uncertainty principle too.

3.6. Euler's identity and the (everyday) "Big Bang"

Let us put some "light" on a world without momentum, without position, without movement, without space, "a world without changes" in our sense, a world where $\sigma(\Delta x) * \sigma(\Delta p) = 0$. Such a world is full of contradictions but not without laws according classical logic and to Heisenberg's uncertainty principle.

Theorem 7. Euler's identity and Big Bang.

Let

R_{ab} denote the Ricci tensor,

R denote the Ricci scalar,

- g_{ab} denote the metric tensor,
 T_{ab} denote the stress-energy tensor,
- $\sigma(\Delta x)$ denote the standard deviation of the uncertainty of the position measurements,
 $\sigma(\Delta p)$ denote the standard deviation of the uncertainty of the momentum measurements,
- t denote the (space) time,
 h denote Planck's constant, $h \approx (6.626\ 0693\ (11)) \cdot 10^{-34} [J \cdot s]$.
 e denote the mathematical constant e , also known as **Euler's constant**. The numerical value of e truncated to 20 decimal places is known to be:
 $e \approx 2.71828\ 18284\ 59045\ 23536$,
 i denote the imaginary unit, one of the two complex numbers whose square is negative one,
Anti e denote the otherness of the mathematical constant e , denoted as **Anti Euler's constant**. Let the numerical value of **Anti e** truncated to 20 decimal places is known to be:
Anti e = $(\pi - e) \approx 0.423310825130748$,
 π denote the mathematical constant π , also known as **Archimedes' constant**. The numerical value of π truncated to 50 decimal places is known to be:
 $\pi \approx 3.14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510$.
 π is known to be $\pi \leq (\text{Anti } \gamma \cdot (c^2/4)) \cdot ((R_{ab})^2 / (T_{ab}) \cdot (R^* g_{ab}))$,
 c denote the speed of all electromagnetic radiation in a vacuum, the speed of light, where
 $c = 299\ 792\ 458 [m / s]$.
 γ denote Newton's gravitational 'constant', where
 $\gamma \approx (6.6742 \pm 0.0010) \cdot 10^{-11} [m^3 / (s^2 \cdot kg)]$.
 μ_0 denote the permeability constant, the magnetic constant, the permeability of free space or of vacuum,
 ϵ_0 denote the permittivity of vacuum, the electric constant.

$$\text{Recall, } (\mu_0 \cdot \epsilon_0 \cdot (c^2)) = 1.$$

Einstein's field equation describes how a field or energy (or matter) and time changes space and vice versa. Einstein's basic field equation (EFE) is usually written in the form

$$(((4 \cdot 2 \cdot \pi \cdot \gamma) \cdot T_{ab}) / (c^4)) + ((R^* g_{ab}) / 2)) = (R_{ab}).$$

Let

$$e^{(i \cdot (\text{Anti } \gamma)^{(c^2/4)) \cdot ((R_{ab})^2 / ((T_{ab}) \cdot (R^* g_{ab})))} + (\mu_0 \cdot \epsilon_0 \cdot c^2) = 0.$$

The condition for the "Big bang" can be obtained as

$$e^{(i \cdot (\text{Anti } \gamma)^{(c^2/4)) \cdot ((R_{ab})^2 / ((T_{ab}) \cdot (R^* g_{ab})))} + (\mu_0 \cdot \epsilon_0 \cdot c^2) \geq \left(\frac{h}{4 \cdot \pi} \right).$$

Proof.

$$\sigma(\Delta x) * \sigma(\Delta p) \geq \left(\frac{h}{4 * \pi} \right) \quad (42)$$

$$\sigma(\Delta x) * \sigma(\Delta p) - \left(\frac{h}{4 * \pi} \right) \geq 0. \quad (43)$$

Let us imagine or assume a world, where $\sigma(\Delta x) * \sigma(\Delta p) = 0$. In other words let us set $\sigma(\Delta x) * \sigma(\Delta p) = 0$. We obtain Eq. (44).

$$0 - \left(\frac{h}{4 * \pi} \right) \geq 0. \quad (44)$$

It is $\sigma(\Delta x) * \sigma(\Delta p) = 0$. In other words, it is equally true that $\sigma(\Delta x) * \sigma(\Delta p) = 0 = -1 + 1 = e^{(i * \pi)} + 1$. We obtain Eq. (45).

$$\left(e^{(i * (\pi))} + 1 \right) - \left(\frac{h}{4 * \pi} \right) \geq 0. \quad (45)$$

We obtain Eq. (46) according to Eq. (37) and Eq. (45)

$$e^{(i * ((\text{Anti } \gamma)^{(c * c / 4)) * ((R_{ab})^2 / ((T_{ab})^{(R * g_{ab}))}))} + (\mu_0 * \epsilon_0 * c^2) - \left(\frac{h}{4 * \pi} \right) \geq 0. \quad (46)$$

According to Euler's identity, Einstein's field equation, Heisenberg's uncertainty principle and the General contradiction law, we obtain the condition of the "Big Bang" as

$$e^{(i * ((\text{Anti } \gamma)^{(c * c / 4)) * ((R_{ab})^2 / ((T_{ab})^{(R * g_{ab}))}))} + (\mu_0 * \epsilon_0 * c^2) \geq \left(\frac{h}{4 * \pi} \right). \quad (47)$$

Q. e. d.

If Eq. (47) is the formula on which our world is grounded, if Eq. (47) is the condition for the begin of our world, it must be equally the condition for further development of the same and thus present everywhere and every day around us. In so far, if Eq. (47) is correct it must hold true that without Euler's identity, no "Big bang". In this case, people named **Euler's identity** rightly too as one of the greatest equation ever (Crease 2004). What does i denotes in this context, **the imaginary, the absolute**? Is something imaginary necessary for the creation, the begin and the further development of our world?

4. Discussion

This publication has proved that Archimedes' constant π is not a constant, a "dead thing", π changes all the time has to do with the begin of our world too. This "constant" is dependent on energy, time and space and is determined by its own counterpart Anti π . The relationship between Archimedes' constant π and Anti π is based on the general contradiction law. According to the unified field equation and based on the general contradiction law, we were able to derive the relationship between π and Anti π as

$$\pi * (\text{Anti } \pi) \leq (c^2) / 4.$$

On the other hand, Euler's number e and Archimedes' constant π are interrelated. The relation between e and Anti e determined by π and can be expressed as

$$e * (\text{Anti } e) \leq (\pi^2) / 4.$$

It is claimed that **Euler's identity** is one of the greatest equation ever. It is possible, that this is reasonable since there is a relationship between **Euler's** identity, **Einstein's** field equation and Heisenberg's uncertainty principle. Based on this relationship, a condition for the begin of our world, for the "Big Bang", could be found in Euler's identity as

$$\left(e^{(i * ((\text{Anti } \gamma) * (c * c / 4)) * ((R_{ab})^2 / ((T_{ab}) * (R * g_{ab})))} + (\mu_0 * \epsilon_0 * c^2) \right) \geq \left(\frac{h}{4 * \pi} \right). \quad (48)$$

In last consequence,

the creation of our world out of nothing,

according to Boole and Eq. (48),
could be possible.

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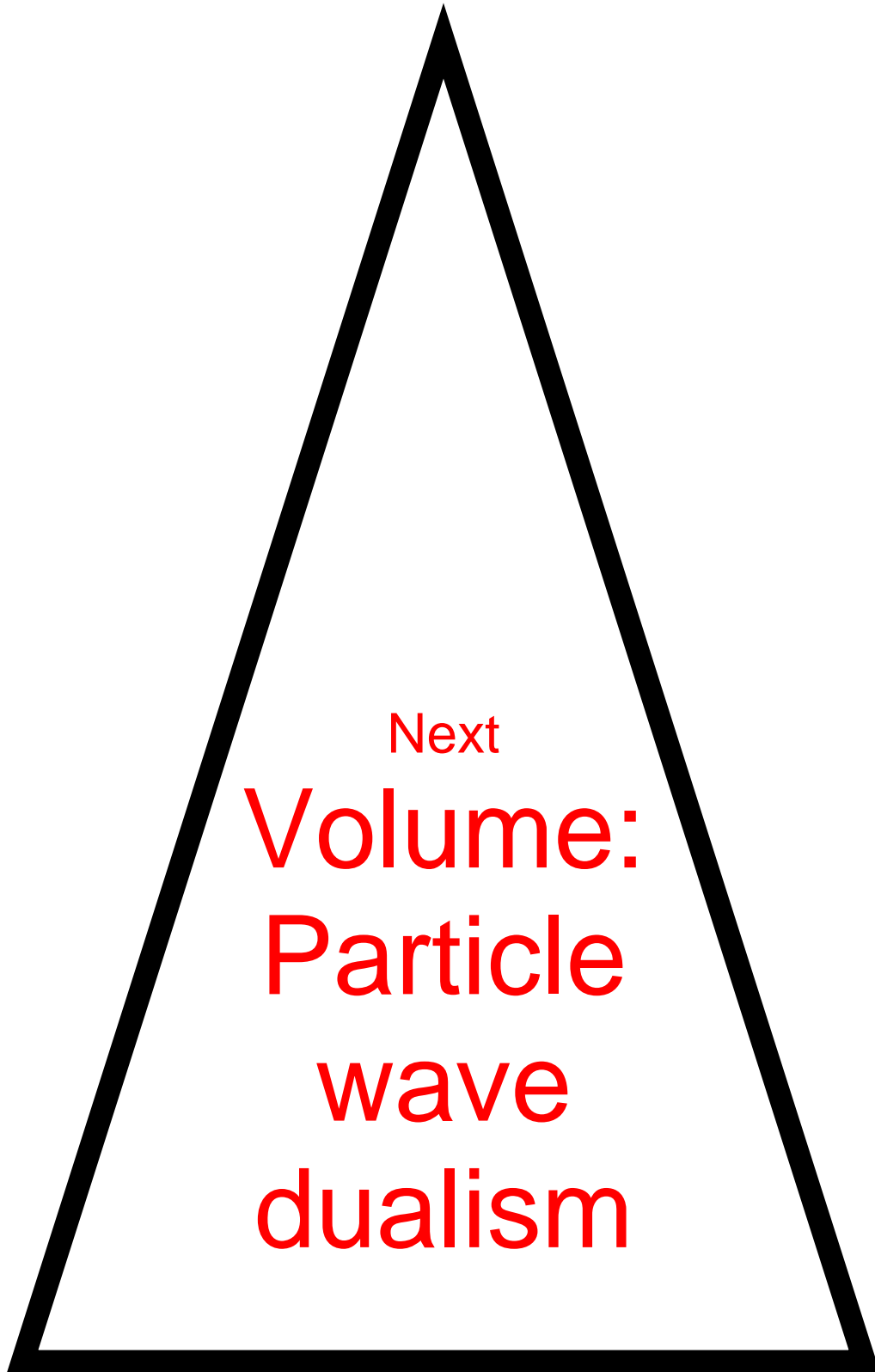
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Darkness-
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