Riemann Hypothesis solved through physics-math in new cosmological model: the Double Torus Hypothesis.

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Abstract.

The Double Torus Hypothesis is a newly proposed cosmological model. It reaches further than quantum-dynamics. It are 'sub-quantum dynamics' in the Double Torus, which show how new insights lead to the solution of the Riemann hypothesis. The secret is the existence of the continuous recalculation by two additional time-clocks from below the Planck-scale. Several of my papers describe this additional time in a new dark energy-force formula. This formula shows that a quantum-Newton-force and a sub-quantum dark matter-space-force perform extreme small accelerations that function as the exponent of the number 'e', where it enables sub-quantum-vacuum to expand or contract. The clue to the solution of the Riemann hypothesis is, that these physics sub-quantum-accelerations connect with 'π' for surfaces below the elementary quantum-surface. I show how the famous Euler-formula e^$i\pi$ +1=0 is related to that process and I also show this Euler-formula can be related to the Riemann hypothesis by expressing the prime-numbers in the inverse Riemann hypothesis. I relate that configuration to the divided structure of an elementary quantum-surface. This leads to a configuration that solves the Riemann hypothesis. So, now is the moment to announce how I did that. I realize this might be experienced as shocking, because I am an outsider: I'm an independent cosmologist. Hopefully my solution awards me with the 1 million USD-price by the Clay Mathematics Institute (this dated pdf-file has been send to the Clay Mathematics Institute).

Introduction.

The Riemann Hypothesis is one of the mathematical problems that have not been solved yet. The Clay Mathematics Institute promised to award a 1 million US dollar price to the one who solves the Riemann Hypothesis. Logically the expectations were heading to abstract mathematics for that proof, but what I did is using arguments from a cosmological physics point of view that is described in my Double Torus Hypothesis. This hypothesis describes a 'new dark energy force' and an 'amount of new dark energy', both proving we live in a rotational universe. There the quantum-Newton-gravity is recalculated continuously by a sub-quantum-dark matter-space force. Herein lies the key for the solution of the Riemann Hypothesis.

As we speak I will partially go into repetition of presenting detailed derivations that led to my (new) dark energy force formula, as well as the amount of (new) dark energy in the Double Torus Hypothesis. I also summarize achievements within the framework of the Double Torus Hypothesis, thereby using just the issues focused on solving the Riemann Hypothesis.

In advance I prefer to mention names as Alain Connes and Boris Zilber, who mathematically contributed intensively to the abstract mathematics for a spacious quantum-torus and for proving that such quantum-torus is a stable object within the 'uncertainty principle of Heisenberg'. Also the mathematical analysis of 'pseudo exponentiation' as being a unique tool in a function that generates new numbers related to the number 'e' is a fundament in having a quantum-torus for real. The number 'e' performs growth in all kinds of processes and statistics. That triggered me in using it for the recalculation-mechanism in the Double Torus Hypothesis. This recalculation excludes the Big Bang as the current cosmology. Instead the Double Torus Hypothesis posits the universe is an eternal rotational manifestation of recalculation by two extra time-clocks from below the Planck-scale. This means parallel universes are all within the Double Torus Universe!

Is there experimental proof for the Double Torus Hypothesis (DTH)? Yes there is, only you have to see it. Such as a lowest limit of the Newton-acceleration, which is calculated at $\approx 2.8 \times 10^{-14}\ ms^{-2}$ in the DTH, almost equal to the experimental value at $\approx 5 \times 10^{-14}\ ms^{-2}$. But also the discrepancy for vacuum energy-density (calculated differently in quantum-theory versus general relativity) is solved in the DTH by the reduction of a factor 10^{122} to the value 10^{-8} [Jm^{-3}], and thus very near to '0'. Also a 'dark flow' is dimensionally derived from the (new) dark energy-force formula in the DTH, while such a flow is indeed observed astronomically. Then there is also the alpha-dipole (different values for the 'fine-structure constant' in two opposite directions of the hemisphere), which are observed astronomically, but also derived from the (new) dark energy force formula: The 'alpha' is flowing along with the 'dark flow', making it larger or smaller depending on whether the flow approaches the observer or is moving away from the observer. That is proof for a rotational universe. Additionally this is derived from the dimension of the amount of (new) dark energy in the DHT. The rotation is for many still hidden in the CMB, but by logical reasoning I noticed the cold-and hot-spots in the CMB are slightly shifted. In this respect I proposes reasonable arguments in my papers [1], next to the evidence by a dark flow, for a rotational universe.

Is the Double Torus Hypothesis is a newly proposed cosmological mode, that reaches further than quantum-dynamics? Yes! It are the 'sub-quantum dynamics' in the Double Torus that show how new insights lead to the solution of the Riemann Hypothesis. The secret is the existence of the continuous recalculation by two additional time-clocks from below the Planck-scale. That is described in several of my papers. This formula shows that a quantum-Newton-force and a sub-quantum dark matter-space-force perform extreme small accelerations that function as the exponent of the number 'e', where it enables sub-quantum-vacuum to expand or contract. Here the clue to the solution of the Riemann hypothesis is, that these physics sub-quantum-accelerations connect with 'π' for surfaces below the elementary quantum surface. Therefore I succeeded in showing how the famous Euler-formula $e^{i\pi}+1=0$ is related to that process. I also show this Euler-formula can be related to the Riemann hypothesis by expressing the prime-numbers in the inverse Riemann Hypothesis. I relate that configuration to the divided structure of an elementary quantum-surface. This leads to a configuration that solves the Riemann hypothesis. However, remarkably I show my solution for the Riemann-Hypothesis is just a specific case of a more general solution !

I am aware, by the title *'Riemann Hypothesis solved through physics-math in new cosmological model: the Double Torus Hypothesis'*, it might introduce uncertainty, because both are an hypothesis. But I came up with all kinds of theoretical evidence, which match experimental evidence. So, that makes it not uncertain. Moreover, if a 'vice-versa logic' is applied, the solution for the Riemann Hypothesis from the physics-math of the Double torus just implies the possibly additional evidence for the Double Torus Hypothesis.

I realize this might be experienced as shocking, because I am an outsider: I'm an independent cosmologist. If this would award me with the 1 million USD-price by the Clay Mathematics Institute, I will be honored (a dated pdf-file has been send to the Clay Mathematics Institute).

Summary of math-physics ruling the Double Torus Hypothesis.

The Double Torus Universe (expressed in my handwritten notes in fig. 1, but also in others of my vixra-papers) is a larger outer torus of (new) dark energy-time enclosing (and intertwining) a smaller inner torus of dark matter-space. Derivations were also analyzed in my former published ‘papers’[1].

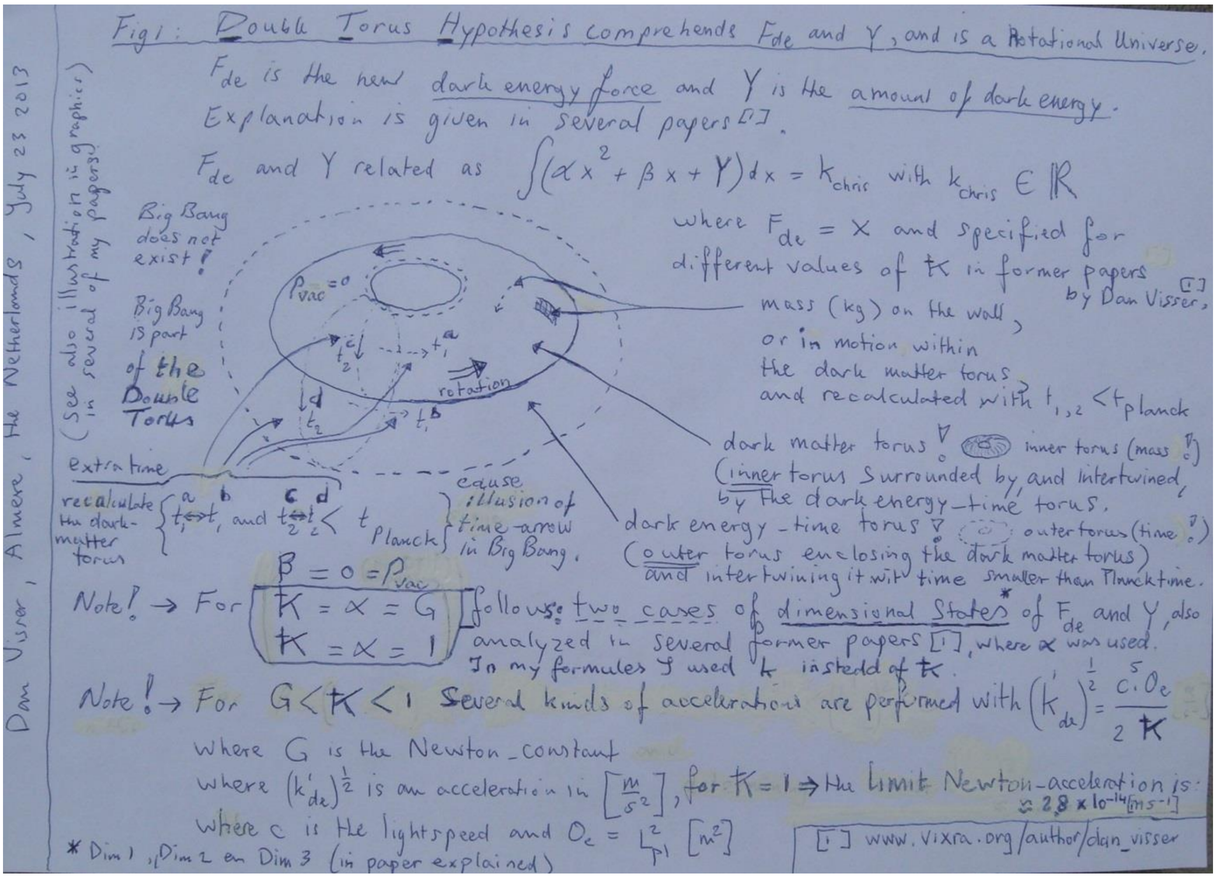

Fig. 1: The Double Torus Hypothesis comprehends a (new) dark energy force formula (F_{de}) and an amount of (new) dark energy (Y). The dimensions of (F_{de}) and (Y) depend on Ҝ = α =1 or Ҝ = α =G, where α is the original notation from the pre-mature mathematical expression in the first vixra-paper in 2009 of the Double Torus. Additional developments give me a view on how G<Ҝ<1 , Ҝ =G, and Ҝ =1 determines all kinds of quantum- and sub-quantum-accelerations that fit the ‘pseudo-exponentiation’ of ‘e’ related to mathematics that concerns the Riemann Hypothesis. What I did is: Explaining the Riemann-hypothesis from the physics-math point of view of the Double Torus Hypothesis.

The Double Torus Hypothesis (fig. 1) implies a rotational universe. References can be found in several of my vixra-papers[1]. The rotational characteristic of the universe follows from a (new) dark energy force formula, which comprehends two forces. One: A quantum-Newtonian-force. Second: A (new) sub-quantum dark matter-space-force. Both interact each other in vacuum and both are splitting vacuum into a thin-and thick-vacuum. Additional a (new) amount of dark energy (Y) describes a universe as a Double Torus too. The $F_{de} = F_N$ [Dim 1 or 2] x (±) F_{dm} [Dim 1 or 2]. These ”Dim’s” are a notation for the two different dimensional states for, as well the (new) forces, as the amount of (new) dark energy. For example $F_{for\ G}$ is expressed in [Newton], or $F_{for\ G=1}$ is expressed in [m^2] with respectively $(F_{dm})_{for\ G}$ is expressed in [$(kgm)^3$], or $(F_{dm})_{for\ G=1}$ is expressed in [$(m^2s^{-1})^3$]. The latter is a dimensional ‘dark flow of dark matter-space’. This ‘dark flow’ is essential to the dynamics of the

Double Torus Universe. It is namely being measured astronomically for real. On the other hand the Y also has two different states of dimensions [Dim 3]. This means the $Y_{\text{for G}}$ is expressed in [J^2 . J^2 . $(kg.m)^3$], which is a static Double Torus, while $Y_{\text{for G=1}}$ is expressed in [J^2 . J^2 . $(kg^2.s)^2$], where the $(kg^2.s)^2$ is a recalculational dimension by the extra time from below the Planck-scale.

It all means there is No Big Bang existence, hence space-time will never end as a Big Crunch or Big Bounce. The Big Bang is part of the Double Torus, which means parallel universes are being a part of the Double Torus as different recalculated universe.

There is No Big Bang.

I gave proof for a rotational universe by dimensional analysis of the momentary dark energy and the hot-and cold-spots in the CMB in one of my papers [1]. The latter can be related to the 'dark matter flow'. Central stands the time-process performed by (new) dark energy-time, which is based on two extra time-clocks from below the Planck-time-limit. This means there is no longer a single evolutionary time-arrow going forward in a Big Bang-cosmology. Instead a recalculation takes place, which degrades Big Bang-cosmology towards being a part of a larger cosmology. That larger cosmology is the Double Torus Universe, in which quantum-gravity is recalculated by two extra time-clocks from below the Planck-time-limit.

A new issue in this paper is the *<u>momentary (new) dark energy of the Double Torus Hypothesis</u>*, determined by the extra time-clocks from below the Planck-time-limit and related to the dark energy-time ($t^{2/3}$) and dark matter-time ($t^{1/3}$), for which I refer to fig. 2 for a better visual understanding:

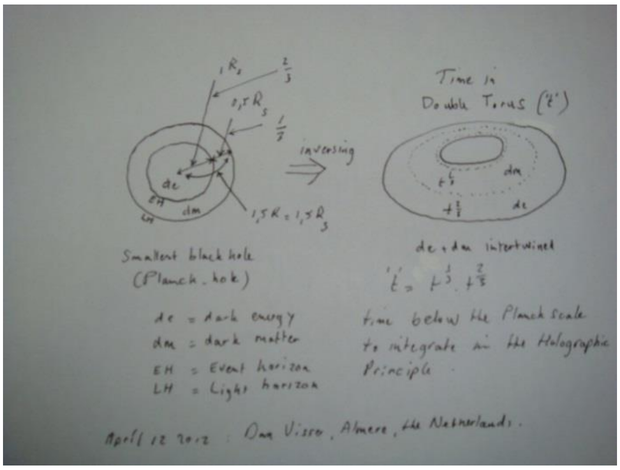

fig. 2

Fig.2: 'Dark energy' and 'dark matter' from a Planck-hole are transformable to time related to 'dark energy' and 'dark matter' in a Double Torus.

After this follows the momentary (new) dark energy, as follows:

$$E_{de} = t^{\frac{2}{3}}.(\pm)(m_{dm})^2\left[s^{\frac{2}{3}}.\left(\frac{m^2}{s}\right)^3\right]$$

$$E_{de} = t^{\frac{2}{3}}.(\pm)(m_{dm})^2\left[\left(\frac{m^6}{s^{2\frac{1}{3}}}\right)\right]$$

$$E_{de} = t^{\frac{2}{3}}.(\pm)(m_{dm})^2\left[\left(\frac{m^6}{s^2.s^{\frac{1}{3}}}\right)\right]$$

$$E_{de} = t^{\frac{2}{3}}.(\pm)(m_{dm})^2\left[\left(\frac{m^3}{s}\right)^2.s^{-\frac{1}{3}}\right]$$

formula set (a)

This is <u>volume-flow (squared), thus a torus, per dark matter time.</u> That shows the exchange between dark energy and dark matter. Other of my equations emerge the ‘dimension of a dark flow’, which marks the flowing of ‘dark matter-space’ in a rotational concept. So, this is what I often mentioned as the recalculation-process in the Double Torus Hypothesis. The ‘momentary dark energy’ may not be confused with the amount of dark energy in the Double Torus, with G=1in its formula:

$Y_{\text{for } G=1} = -1/4\ c^4\ \hbar\ m^6\ [\ J^2\ .\ J^2\ .\ (kg^2.s)^2\ ]$, set (b)

For G = 1 the Y is dimensionally expressed as a recalculation-dimension $(kg^2.s)^2$ that changes the quantum-Newton-gravity on the walls of the dark matter torus inside the Double Torus (fig. 3).

It may be clear that Y with G in its formula ($G \neq 1$), thus $Y_{\text{for } G} = -1/4\ c^4\ \hbar\ m^6\ G\ [\ J^2\ .\ J^2\ .\ (kg.m)^3\ ]$, the equation is as in the original setting of 2009 (see the papers [1]): This is the *static form* of the new dark energy. The explanation I just gave, replaces the *static dimension* $[(kg.m)^3]$ into the *dynamical dimension* $[(kg^2.s)^2]$.

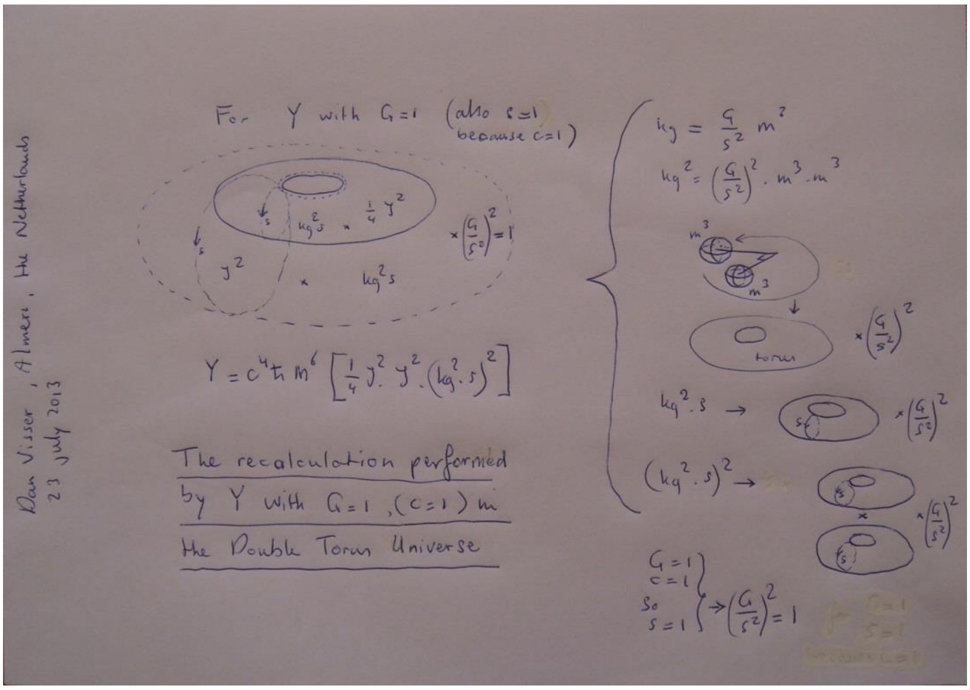

Fig. 3: The recalculation-mechanism in the Double Torus Hypothesis through Y for G=1.

Analysis from static to dynamical dimension:

$Y_{\text{for } G=1}$ = -1/4 c^4 $\hbar$ m^6 [J^2 . J^2 . $(kg^2.s)^2$] where the dimension of [kg] is:

$$\left[kg = G.\frac{m^3}{s^2} = \frac{G}{s^2}m^3 \right] \qquad \text{set (c)}$$

This means [kg^2] is as two volumes-squared, that after rotation result in a torus. The image fig. 3 shows the dimension of [kg^2.s] is therefore expressed as two 'tori' to be multiplied with the two 'energy-tori' already expressed in the dimension as [¼ J^2] and [J^2]. So then follows:

$$\left[\left\{ \left(\frac{G}{s^2}\right)^3 .\left(m^3\right)^3 \right\} x \left(kg.s^2\right)^2 \right], \text{ wherein } \left(\frac{G}{s^2}\right)^3 = 1 \text{ (because G = 1, c = 1, hence s=1)} \qquad \text{set (d)}$$

The dimensional part (kg^2.s) is performing twice (because of its squared status) on the two other energy 'tori'. From the dimensional analysis is shown the recalculation uses two extra time-clocks time from below the Planck-time-limit.

F_{de} and Y in my former vixra- papers.

Firstly I refer to my papers[1], of which several papers worked out derivations to analyze and express F_{de} and Y. I will use a part of these formula-derivations hereafter to explain the road for solving the Riemann Hypothesis.

Secondly I repeat to mention, I calculated the *limit for the lowest Newton-acceleration* (≈ 2.8 x 10^{-14} [m/s^2]) by using my (new) dark energy force formula (F_{de}). This formula can be divided in two parts that connect in a product and depend on {G < Ꝁ < 1}, where Ꝁ covers all the values larger Newton-constant values, but smaller than 1. Separately Ꝁ = G and Ꝁ = 1have been explained to express the dimensional states of F_{de} and Y. In paper[3] I used κ for Ꝁ, because I preferred to distinguish values larger than the Planck-surface O_e by the number n = 1,2, 3, … ect., and smaller values by 1/n = 1, ½, 1/3 … ect.

As I said earlier, one part of the formula is a quantum-Newtonian gravitational force, while the other part is a sub-quantum dark matter-space force. The lowest limit of the Newton-acceleration is applicable on both parts. This leads to two cases of different dimensional states in the formula. One state is: Gravity is projected on the wall of a volume (for example by the observed CMB), or it will be gravity in motion within the Hubble-radius. The other part is the sub-quantum dark matter-space force, representing a *dark flow of dark matter-space that proves a rotational Universe.*

I prefer to repeat that *an alpha-dipole (alpha is the fine-structure-constant), which is astronomically observed with smaller and larger values ,gets speed by the 'dark flow' (that drags the light-speed along with the dark matter space flows).* When this is added to an analysis of the Planck-data-image of the CMB published in 2013, hot- and cold-spots could be seen in the CMB. All these arguments are proof for a rotational universe. What we observe is an approaching 'dark flow' and a moving away 'dark flow'. That gives the dipole-character to 'alpha'.

Now I will describe the formulas F_{de} and Y again in general physics-math-expressions as in my former vixra-papers, in order to line-up for the physics-related solution for the Riemann Hypothesis.

Fig.4: Dan Visser (*1947), NL Almere, photograph 2008.

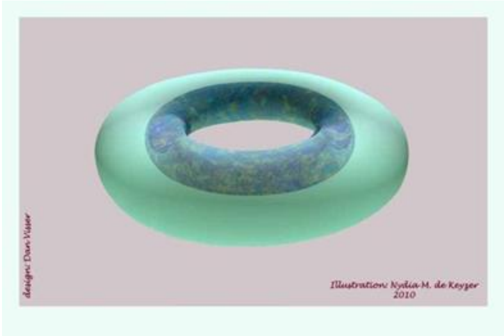

Fig.5: Double Torus Universe (graphical illustration), a dark energy-time torus (light green) is enclosing and intertwining an inner ‘rotational flowing’ dark matter torus. (dark blue-green) inside the dark energy-time torus.

Refer further to the Formulas, next page.

The formulas.

In the following chapters the result of my derivations are given, as they were published in the Vixra-archive earlier [4].

My dark energy force formula in the original setting of April 4 2004:

$$F_{de} = -km^3 = -\left(\frac{c^5 O_e}{2G}\right) m^3 \left[\left(kgm\right)^3 \frac{N}{s} \right]$$
$$k = k_{de} \frac{1}{G} \qquad (1)$$
$$k_{de} = \frac{c^5 O_e}{2}$$

Since the first paper was published in 2009 the "+"sign also became part of the formula (1).

$$F_{de} = \pm km^3 = \pm\left(\frac{c^5 O_e}{2G}\right) m^3 \left[\left(kgm\right)^3 \frac{N}{s} \right]$$
$$k = k_{de} \frac{1}{G} \qquad (2)$$
$$k_{de} = \frac{c^5 O_e}{2}$$

The original setting was supported by the general mathematical expression of Christopher Forbes, which showed the additional "+" sign. For causing no confusion with my "k" I use k_{chris} in his equation:

$$\int \left(\alpha x^2 + \beta x + \gamma\right) dx = k_{chris}, k_{chris} \in \mathbb{R}$$
$$for \quad \int (0)\, dx = k_{chris} \quad follows \quad \int \left(\alpha x^2 + \beta x + \gamma\right) dx = \int (0)\, dx$$
$$from \quad \int \left(\alpha x^2 + \beta x + \gamma\right) dx = \int (0)\, dx \quad follows \quad \left(\alpha x^2 + \beta x + \gamma\right) = 0 \qquad (3)$$
$$for \quad \alpha = G, \quad \beta = 0, \quad \gamma = -\frac{1}{4} c^4 \hbar^2 M^6 G \quad follows \quad x = \pm \frac{1}{2} c^5 m^3 G^{-1} \left(L_{Planck}\right)^2$$

The "x" is identical to my (new) dark energy force formula (F_{de}) in equation (2), wherein $O_e = (L_{Planck})^2$, as follows:

$$F_{de} = \pm km^3 = \pm\left(\frac{c^5 O_e}{2G}\right) m^3 \left[\left(kgm\right)^3 \frac{N}{s} \right] \qquad (4)=(2)$$

Moreover, the dark energy from equation (3) was newly introduced by Christopher Forbes:

$$\gamma = -\frac{1}{4} c^4 \hbar^2 M^6 G \qquad (5)$$

Further analysis during my solitaire research, after the contact with Forbes got lost, showed the dimensions:

$$\left[\left(\frac{m}{s}\right)^4 (Js)^2 kg^6 \frac{m^3}{kgs^2}\right] = \left[\frac{m^4}{s^4} J^2 s^2 kg^6 \frac{m^3}{kgs^2}\right] = \left[\frac{m^4}{s^4} J^2 kg^5 m^3\right] = A$$

$$A = \left[kg^2 \frac{m^4}{s^4} J^2 kg^3 m^3\right] = \left[\left(kg \frac{m^2}{s^2}\right)^2 J^2 (kgm)^3\right] = \left[J^2 J^2 (kgm)^3\right] \tag{6}$$

$$from \quad this \quad follows \quad -\gamma\left[\frac{1}{4} J^2 J^2 (kgm)^3\right]$$

As you can see these dimensions are two energy-spaces, one as [J^2] and one as [1/4 J^2] both forming a circular description of an small energy-torus within an a four times larger energy torus. Both also co-describe with a 3D mass-sphere-surface in [$(kgm)^3$], which is equivalent to a torus itself.

This means the larger energy torus intertwines the inner smaller torus. This fully describes the Double Torus topology as a (new) dark energy torus, enclosing and intertwining an inner (dark) matter torus. However, after having published several papers in the Vixra, I published my dark energy force formula in another equivalent setting.

The dark energy force formula in the setting of January 2013.

I started with equation (4) = (2)*:*

$$F_{de} = \pm m^3 k_{de}\left[(kgm)^3 \frac{N}{s}\right] \tag{7}$$

Wherein $k_{de} = \dfrac{c^5 O_e}{2\kappa}$,with κ = G, or κ =1

I transformed it into a product of visible mass and dark matter mass, which both accelerate. This split-up in visibility and darkness is justified, because another of my papers already derived a split-up due to a match with observations for gravity-conditions in galaxies. For ¼ of the dark matter-density the gravity-conditions for dark matter are the same as for gravity based on visible matter[5].

The split-up is as follows:

$$F_{de} = m_{vm} k'_{de} \otimes \pm m^2{}_{dm} k'_{de}\left[(kgm)^3 \frac{N}{s}\right] \tag{8}$$

$$k'_{de} = (k_{de})^{\frac{1}{2}} = \left(\frac{c^5 O_e}{2\kappa}\right)^{\frac{1}{2}}\left[\frac{m}{s^2}\right] \tag{9}$$

Wherein, κ defines the conditions <u>larger than</u>, <u>at the edge</u>, and <u>within</u> the *Planck-surface.*

This would lead to lowest acceleration-limits (↓lim) as follows:

$$F_{de} = \downarrow \lim\left(F^{G}{}_{N}\right) \otimes \downarrow \lim\left(\pm F_{dm}\right)\left[\left(kgm\right)^{3}\frac{N}{s}\right] \tag{10}$$

Now the conditions for κ can be described:

1. For an area <u>larger than</u> the Planck-surface, $\left(nO_e\right)$ with $n = 1, 2, 3, \ldots\ldots.., N$, follows for :

$$\left(k_{de}\right)^{\frac{1}{2}} > \downarrow \lim\left(g\right) \xrightarrow{1} \left(\kappa = G\right) \xrightarrow{2} \left(k_{de}\right)^{\frac{1}{2}} = \left(\frac{c^5 O_e}{2G}\right)^{\frac{1}{2}} > \downarrow \lim\left(g\right)\left[\frac{m}{s^2}\right] = (A)$$

$$(A) \Rightarrow F^{G}{}_{N} = mg\left[N\right] = G\frac{Mm}{r^2}\left[N\right] \tag{11}$$

2. For an area <u>at the edge,</u> or <u>within,</u> the Planck-surface, $\left(\frac{1}{n}O_e\right)$, with $n = 1, 2, 3, \ldots\ldots.., N$, follows for :

$$\left(k_{de}\right)^{\frac{1}{2}} < \downarrow \lim\left(g\right) \xrightarrow{1} \left(\kappa = 1\right) \xrightarrow{2} \left(k_{de}\right)^{\frac{1}{2}} = \left(\frac{c^5 O_e}{2}\right)^{\frac{1}{2}}\left[\frac{m}{s^2}\right] = (B)$$

$$(B) \Rightarrow \xrightarrow{1} F^{G=1}{}_{N}\left[m^2\right] \xrightarrow{2} F_{dm} = \pm m^2{}_{dm}\left(\frac{c^5 O_e}{2}\right)^{\frac{1}{2}} \tag{12}$$

The dimension F_{dm} in equation (12) is as follows:

$$\left[\left(kgm\right)^3\frac{N}{s}\right] = \left[kg^3 m^3\frac{N}{s}\right] = \left[\left(G\frac{m^3}{s^2}\right)^3 m^3\frac{N}{s}\right] = \left[G^3\frac{m^9}{s^6}m^3\frac{N}{s}\right] = \left[G^2\left(G\frac{m^4}{s^4}\right)\frac{m^8}{s^3}N\right] = (C)$$

$$(C) = \left[G^2\frac{m^8}{s^3}N^2\right] \tag{13}$$

Newton-gravity-force <u>at the edge</u> and <u>within</u> the Planck-surface has G=1 and the Newton-gravity-force is maximum, $[N^2]=1$.

So the dimension of (C) will be:

$$(C) = \left[G^2\frac{m^8}{s^3}N^2\right] = \left[\frac{m^2 m^6}{s^3}\right] \tag{14}$$

This is representative for the January 2013-setting of the dark energy force formula, as follows:

$$F_{de} = \left\{\left(F^{G}{}_{N}\right)\left[m^2\right]\right\} \otimes \left\{\left(\pm F_{dm}\right)\right\}\left[\frac{m^6}{s^3}\right] \tag{15}$$

It is identical to:

$$F_{de} = \left\{ \left(F^{G}{}_{N} \right) \left[m^2 \right] \right\} \otimes \left\{ \left(\pm F_{dm} \right) \right\} \left[\left(\frac{m^2}{s} \right)^3 \right] \tag{16}$$

It gives a dimensional solution for dark matter and dark matter force:

$$F_{dm} = \pm m^2{}_{dm} \left[m^2 m^2 \frac{m}{s} \right] \left(k_{de} \right)^{\frac{1}{2}} \left[\frac{m}{s^2} \right] = \pm \left(k_{de} \right)^{\frac{1}{2}} m^2{}_{dm} \left[\left(\frac{m^2}{s} \right)^3 \right] \tag{17}$$

Which is identical to:

$$F_{dm} = \pm \left(\frac{c^5 O_e}{2} \right)^{\frac{1}{2}} \left[\frac{m}{s^2} \right] . m^2{}_{dm} \left[m^2 m^2 \frac{m}{s} \right] \tag{18}$$

Which is identical to:

$$F_{dm} = \pm \left(\frac{c^5 O_e}{2} \right)^{\frac{1}{2}} . m^2{}_{dm} \left[\left(\frac{m^2}{s} \right)^3 \right] \tag{19}$$

This equation (18) and (19) represent 'dark matter mass' with a dimension of a *'spinning torus'* (see also fig. 3). This *'spinning torus'* also accelerates in two opposite directions, which makes it either to expand or contract. That is expressed in equation 19, showing the dark matter force has the dimension of a '*dark flow*' (a surface-flow in three dimensions).

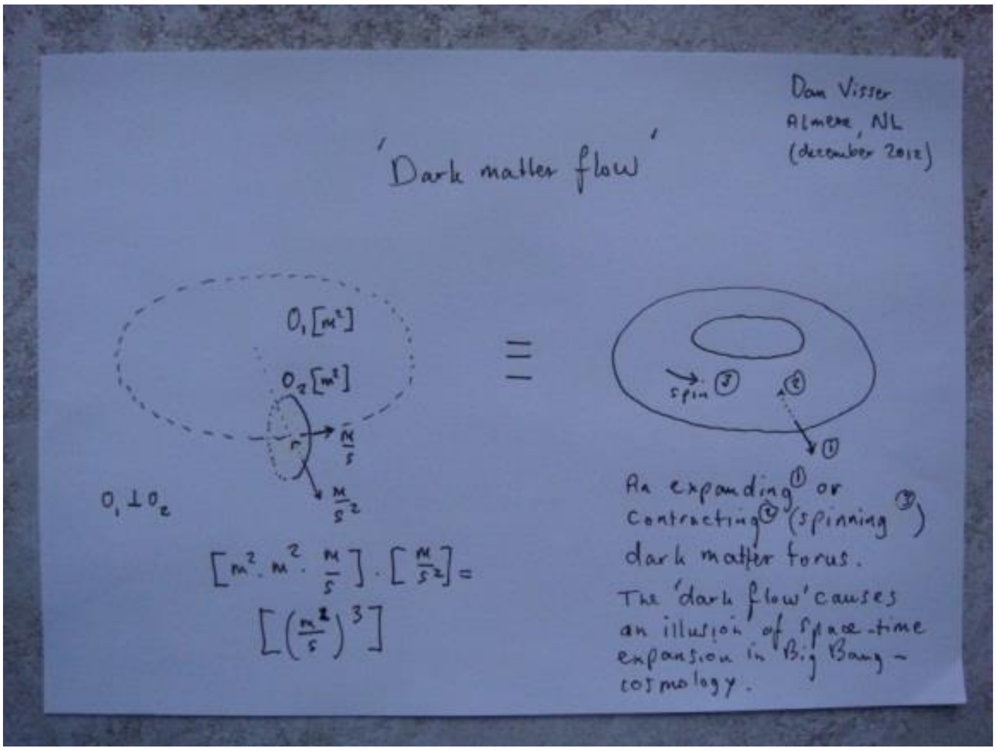

Fig. 6: Dark matter-flow in the Double Torus hypothesis.

Towards the physics-math point of view in proving the Riemann Hypothesis.

In the road to the solution of the Riemann Hypothesis a connection of visible light is made by using the elementary quantum-surface O_e in the Double Torus Hypothesis for the two time-clocks from below the Planck-scale through with (1/6) O_e, with $O_e = (L_{Planck})2$. This can be visualized as follows:

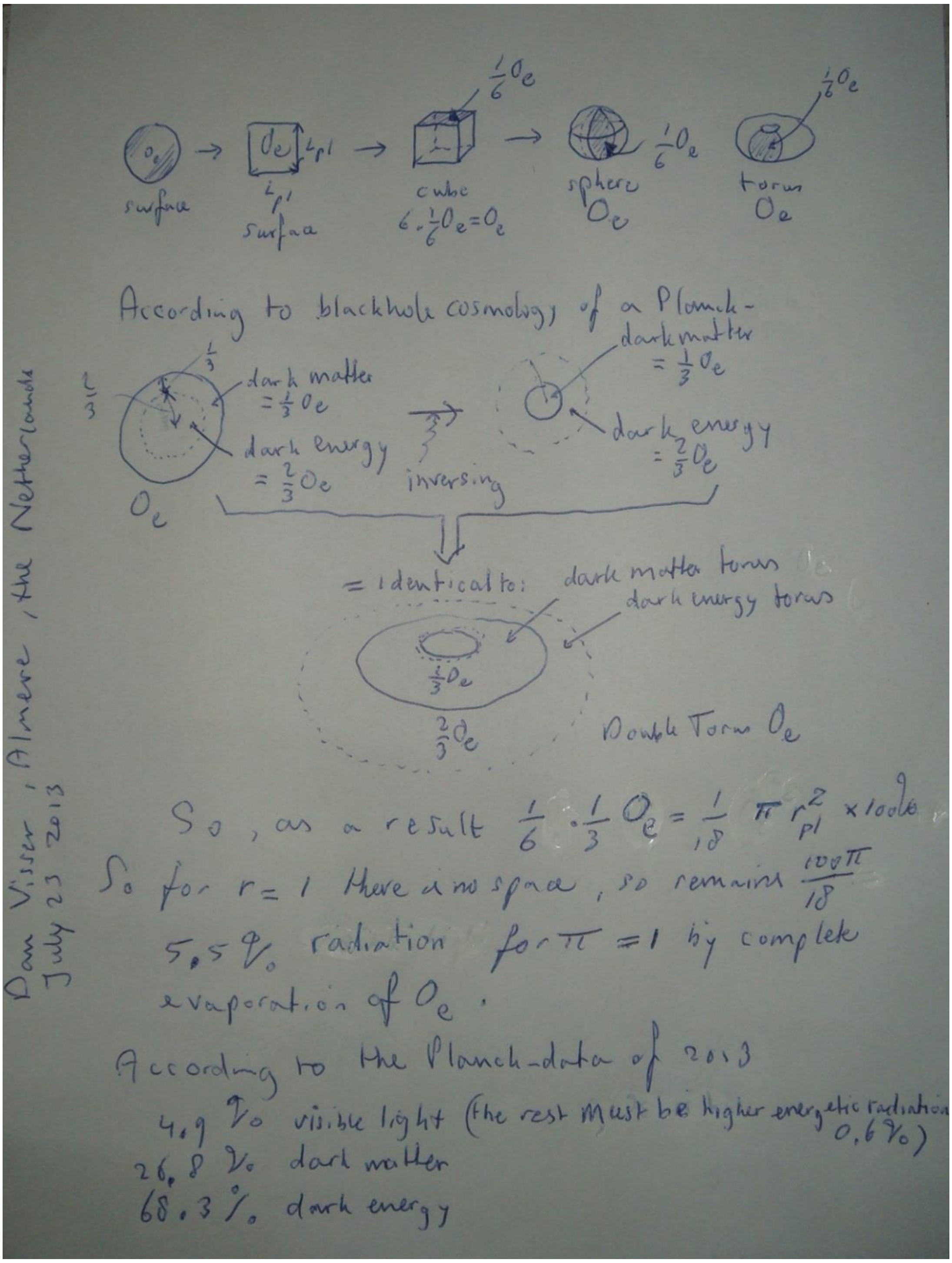

Fig. 7: There is 4.9% visible light measured by the Planck-data in 2013. Compared to the calculation in the Double Torus Hypothesis 1/6 of 1/3 of the dark matter in the Planck-surface is calculated to emerge into an evaporation of 5.5% light-radiation. This means 0.6% is higher energetic light-radiation.

From the connection of visible light related to dark energy and dark matter from below the Planck-scale a step can be made to the recalculation-process in the Double Torus Hypothesis.

The use of sub-quantum space-expansion by dark matter-space in vacuum to quantum-gravity and micro-gravity as a tool for the solution of the Riemann Hypothesis.

For this I refer to my equations (1) to (19), which describe quantum-Newton-gravity and sub-quantum-dark matter-space-force in one formula. One of the characteristics is:

- The elementary quantum-surface in the Double Torus Hypothesis is $O_e = \pi \, . \, (r_{pl})^2$ and leads for G = 1 and r_{pl} = 1 to π (seefig.17).
- Specifically equation (17) shows the negative acceleration of dark matter-space, which generates the *sub-quantum expansion by the lowest limit of the Newton-acceleration*. The exponent of k_{de} in $(-k_{de})^{\frac{1}{2}}$ then must become 'o' to enable that sub-quantum-expansion, and so follows:
- $\left\{(-k_{de})^{0}\right\}^{\frac{1}{2}}$ (20)
- So this can be written by the acceleration $\left\{(-k_{de})^{0}\right\}^{\frac{1}{2}} = (-1)^{\frac{1}{2}} = i$ (21)
- On the contrary $(+k_{de})^{\frac{1}{2}}$ generates contraction, which leads to *quantum-gravity*.
- When both the quantum-Newton-force and the sub-quantum-dark-matter-space-force generate quantum-gravity, then the squared value $\left\{(+k_{de})^{\frac{1}{2}}\right\}^{2} = +k_{de}$ generates *micro-gravity*.

So, these characteristics have a cosmological point of view within the framework of the Double Torus Universe. They are based on as well 'growth' by expansion as 'shrinking' by gravity . The number e^{x} stands for growth. Such also fits into the recalculation-mechanism of the Double Torus Hypothesis. The expansion takes place in vacuum by distinguishing quantum-gravity and expansion of dark matter-space. The latter generates: + and – accelerations, as follows:

- The acceleration $\pm(k_{de})^{\frac{1}{2}}$, which performs 'pseudo-exponentiation' as a unique form of exponentiation found by the mathematics of Boris Zilber.
- Herewith I want to explain explicitly, that the reality in the Double Torus Universe is determined by no discrepancy in the density of vacuum energy (calculated a factor 10^{122} larger by the quantum-theory than by the theory of General Relativity). This enormous factor is eliminated. The reason is vacuum-energy-density is distributed all the way through the Double Torus and not limited by the solitaire presence in in a Big Bang cosmology. So, the result is a vacuum energy-density of almost '0' according to the calculations of the General relativity.

So π and i can be given a place in the Euler-formula:

- $e^{i\pi} + 1 = 0$ (Euler formula). (22)

The addition of +1 to the exponent of e is needed to fulfill to the vacuum energy density '0' in the Double Torus. This is a fundamental demand. In the end of this paper this demand returns again, because i is not the only exponent-state of 'e'.

As may not yet be clear the afore mentioned insights are fundamental for the yet unsolved Riemann Hypothesis. On one hand the Riemann Hypothesis is related to the Riemann Zeta-function ξ(s) and on the other hand it is related to the inverse Zeta-function 1/ ξs) representing the prime-numbers. That I will use in further derivations and logic to prove the Riemann Hypothesis. My detailed explanation is given by a (handwritten) figure 8. This figure shows how the Euler-formula is finding its role in combination with the Riemann Zeta-Function from this new cosmological point of view, the Double Torus Universe..

The explanation starts with the question "what is the meaning of the Riemann *'critical band*'.

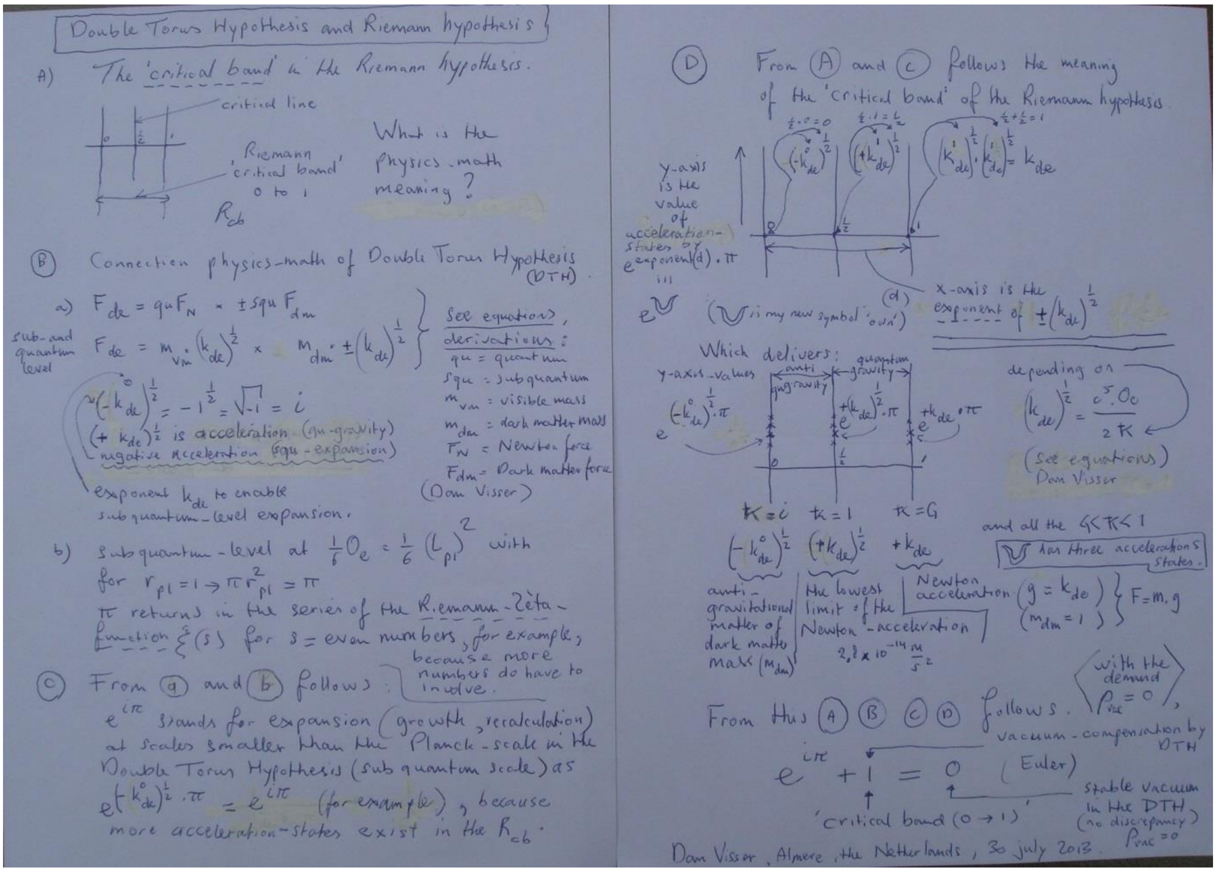

Fig. 8: The Riemann hypothesis is embedded in the Double Torus Hypothesis from a physics-math point of view. The most important thing is: ± $(k_{de})^{1/2}$ *is the exponent of 'e' and functional in the 'critical band' of the Riemann Hypothesis.* This means the 'critical band' connects to 'quantum-dark matter-space' and 'quantum-visible mass' in the (new) dark energy force formula, which is a force in the Double Torus Universe. It refers to equations (1) to (19), wherein Ҡ = G and Ҡ = 1 characterize the quantum-gravity and K = *i* the anti-gravity. And because there is no longer a discrepancy in vacuum energy-density compared to the Big Bang cosmology, the Euler formula represents the recalculation $e^{i\pi} + 1 = 0$ in the Double Torus Universe instead of expansion in the Big Bang. The Big Bang is part of the Double Torus. And any parallel universe is imaginable in the Double Torus Universe, existing all at the same time. That is the new paradigm in the Double Torus Cosmology.

The Riemann Zeta function is in terms of the Double Torus hypothesis an arithmetic-format to calculate everything that happens in the 'critical band', wherein sub-quantum dark matter-space and quantum-Newton-gravity perform an interactive recalculation.

Further work-out of the Riemann Zeta function ξ (s) and the series of prime-numbers expressed in 1 / ξ (s) taking into account three fundamental exponent-states of 'e' and the elementary quantum-surface subdivided in six parts to form a sub-quantum-torus.

For the applying Riemann Zeta Function I refer to fig. 7, wherein the first remarkable eye-catcher is:

$$\{1.(O_e) \cdot (1/6).(O_e)\} = (1/6) \cdot \{\pi^2 (r^4)_{pl}\} \tag{23}$$

For $r_{pl} = 1$ (which means quantum-space is replaced by two extra time-clocks), the Riemann Zeta-function $\xi(s) = \xi\,(2)$ becomes as follows:

$$\xi(2) = \frac{\pi.{r_{pl}}^2}{1} \cdot \frac{\pi.{r_{pl}}^2}{2.3} = \frac{\pi^2}{6} \tag{24}$$

When under the line the prime-numbers are used in a follow-up product, such as (2.3), (3.5), (5.7). (7.11), (11.13), ect... for higher Zeta values, an indication for the next convergence-value for $\xi(s) = \xi\,(4)$ is given, wherein $r_{pl} = 1$, and the relation to π is maintained:

$$\xi(4) = \frac{\pi.{r_{pl}}^2}{1} \cdot \frac{\pi.{r_{pl}}^2}{2.3} \cdot \frac{\pi.{r_{pl}}^2}{3.5} = \frac{\pi^3}{90} \tag{25}$$

This indication I have transformed into a general approach.

General approach

The original Riemann Zeta-function, expressed as:

$$\xi(s)_{n \supset +\mathbb{N}} = 1 + \frac{1}{2^s} + \frac{1}{3^s} \ldots.. \frac{1}{n^s} \tag{26}$$

Where (n) are numbers part of the natural positive numbers (+N). So, what I see in equation (25) is the Riemann Zeta Function being expressed in the series of prime-numbers (pn), which are a part of the natural numbers (n), which in turn are part of the natural positive numbers (N), as follows:

$$\frac{1}{\xi(s)}_{pn \supset n \supset +\mathbb{N}} = \left(1 - \frac{1}{2^s}\right) x \left(1 - \frac{1}{3^s}\right) x \ldots.. \left(1 - \frac{1}{n^s}\right) \tag{27}$$

This is equivalent to:

$$\xi(s)_{pn\supset n\supset +\mathbb{N}}^{s\supset \overset{R}{\underset{IR}{\mathbb{R}}}\supset \mathbb{Z}\supset \mathbb{C}} = \left(\frac{1}{1-2^{-s}}\right) x \left(\frac{1}{1-3^{-s}}\right) x..... \left(1-\frac{1}{n^{s}}\right) \tag{28}$$

So, (s) comprehends the real numbers, as well the rational as the irrational numbers, being part of the integer numbers (Z), which are the positive and negative natural numbers (N), and which are part of the complex numbers (C).

Now I return to the three possible exponent-accelerations-states x of e^{x} and I include thereby the *Riemann 'critical band*' at 0, ½ and 1 (see also fig. 8). Hereto I introduce a new symbol and physics acceleration applicable in the Riemann 'critical band':

'$\smile$' is my new symbol 'own'. This means 'e' to the exponent $\smile$, is written as e xp ('own'). So, there are three exponent-states of 'own within the framework of the Double Torus Hypothesis, which mark the *Riemann-critical band* (Rcb), as follows:

For $\smile 1 \;\Rightarrow$ e xp $\left\langle \left\{ \left(-k_{de}\right)^{0} \right\}^{\frac{1}{2}} .\pi = (-1)^{\frac{1}{2}} .\pi = i\pi \right\rangle$; this is at the 'Rcb' = 0, the sub-quantum-scale.

For $\smile 2 \;\Rightarrow$ e xp $\left\langle \left\{ +\left(k_{de}\right)^{\frac{1}{2}} \right\} .\pi \right\rangle$; this is at the 'Rcb' = ½, the quantum-scale.

For $\smile 3 \;\Rightarrow$ e xp $\left\langle + \left\{ \left(k_{de}\right)^{1} \right\} .\pi \right\rangle$; this is at the 'Rcb' = 1, the micro-scale.

Where $k_{de} = \frac{c^{5} O_{e}}{2\kappa} \left[\frac{m}{s^{2}}\right]$ for $G \le \kappa \le 1$, where for $(\kappa = 1) \Rightarrow \left(k_{de}\right)^{\frac{1}{2}} = \left(\frac{c^{5} O_{e}}{2\kappa}\right)^{\frac{1}{2}} \left[\frac{m}{s^{2}}\right] \approx$ 2.8…. x 10^{-14} [ms^{-2}], the lowest Newton-acceleration-limit at quantum-gravity-scale (femto-scale).

And where for $(\kappa = G) \Rightarrow \approx \frac{2.8.....x10^{-14}\left[ms^{-2}\right]}{6.6x10^{-11}\left[Nm^{2}kg^{-2}\right]} \approx 0.42x10^{-3}\left[G.\frac{m}{s^{2}}\right]$, gravity on micro-scale.

The Riemann Zeta Function in this respect represents the sub-quantum, the quantum and the micro-gravity in the Double Torus Hypothesis.

Explicitly I highlight that 'own-1' is *one* of the solutions in the Riemann Hypothesis and that is extraordinary, because the e xp $\left\langle \left\{ \left(-k_{de}\right)^{0} \right\}^{\frac{1}{2}} .\pi = (-1)^{\frac{1}{2}} .\pi = i\pi \right\rangle$ is a new way of describing the sub-quantum-dark matter-space-expansion from below the Planck-scale by the two extra time-clocks that are introduced in the Double Torus Hypothesis. Until now this paradigm-shift was neglected in Big Bang cosmology.

So now this new cosmological point of view is the approach in the solution of the Riemann-hypothesis.

The solution of the Riemann Hypothesis.

1. I use the three exponent states of ‘own’ to get the general solution of the Riemann Hypothesis. Therefore I take the (e xp ‘own’) to represent the ‘recalculation-mechanism within the framework of the Double Torus Universe. I connect this to the arithmetic of numbers in the Riemann Zèta Function. The reason I do this, is because equalization is the connection between physics and the arithmetic with numbers in the Zèta function, wherein also the accelerations in the Rcb participate, included as said, the numbers from $\mathbb{N},\mathbb{Z},\mathbb{R},\mathbb{C}$, and included the prime-numbers.

$$e^{\smile} = \xi(s)\begin{pmatrix} s\supset\mathbb{R}^{R}_{IR}\supset\mathbb{Z}\supset\mathbb{C} \\ \\ pn\supset n\supset+\mathbb{N}\end{pmatrix} = \left\{\left(\frac{1}{1-2^{-s}}\right)x\left(\frac{1}{1-3^{-s}}\right)x.....\left(1-\frac{1}{n^{s}}\right)\right\}^{'own'} \qquad (29)$$

$$(e^{\smile})\left\langle\begin{matrix}+0=0\rightarrow\xi(s)+0=0\\ +\dfrac{1}{2}=0\rightarrow\xi(s)+\dfrac{1}{2}=0\\ +1=0\rightarrow\xi(s)+1=0\end{matrix}\right\rangle; \qquad (30)$$

where $(e^{\smile})+1=0$ is thus a specific solution for the (e xp ’own’) with ‘own-1’ = $\left\{(-k_{de})^{0}\right\}^{\frac{1}{2}}.\pi=(-1)^{\frac{1}{2}}.\pi=i\pi$. That leads to the Euler-fomula $e^{i\pi}+1=0$. It is related to the sub-quantum scale in the Double Torus Universe.

Equation (30) implies:

$$\xi(s)\begin{pmatrix} s\supset\mathbb{R}^{R}_{IR}\supset\mathbb{Z}\supset\mathbb{C} \\ \\ pn\supset n\supset+\mathbb{N}\end{pmatrix} = \left\{\left(\frac{1}{1-2^{-s}}\right)x\left(\frac{1}{1-3^{-s}}\right)x.....\left(1-\frac{1}{n^{s}}\right)\right\}^{'own'}\left\langle\begin{matrix}+0=0\\ +\dfrac{1}{2}=0\\ +1=0\end{matrix}\right\rangle \qquad (31)$$

The general solution for the Riemann Hypothesis follows from all the numbers of $(s)='own'$, as follows:

$$\xi(s)\begin{pmatrix} s='own'\supset\mathbb{R}^{R}_{IR}\supset\mathbb{Z}\supset\mathbb{C} \\ \\ pn\supset n\supset+\mathbb{N}\end{pmatrix} = \left(\frac{1}{1-2^{-'own'}}\right)x\left(\frac{1}{1-3^{-'own'}}\right)x.....\left(1-\frac{1}{n^{-'own'}}\right)\left\langle\begin{matrix}+0=0\\ +\dfrac{1}{2}=0\\ +1=0\end{matrix}\right\rangle \qquad (32)$$

$$\xi(s)=\xi('own')=\left(\frac{1}{1-2^{-'own'}}\right)x\left(\frac{1}{1-3^{-'own'}}\right)x.....\left(1-\frac{1}{n^{-'own'}}\right)=\left\langle\begin{matrix}0\\ -\dfrac{1}{2}\\ -1\end{matrix}\right\rangle \qquad (33)$$

Summarize of the solution of the Riemann Hypothesis:

The general solution for the Riemann Hypothesis based on $(s) = \text{'}own\text{'}$, as follows:

$$\xi(s) = \xi(own')' = \left(\frac{1}{1-2^{-'own'}}\right) x \left(\frac{1}{1-3^{-'own'}}\right) x \ldots\ldots \left(1-\frac{1}{n^{-'own'}}\right) = \left\langle \begin{matrix} 0 \\ -\dfrac{1}{2} \\ -1 \end{matrix} \right\rangle$$

The 'own' is my new symbol $\smile$'. This means 'e' to the exponent $\smile$, written as e xp ('own').

The three exponent-states of 'own, within the framework of the Double Torus Hypothesis, mark the *Riemann-critical band* (Rcb), as follows:

For $\smile 1 \;\Rightarrow$ e xp $\left\langle \left\{\left(-k_{de}\right)^{0}\right\}^{\frac{1}{2}} .\pi = (-1)^{\frac{1}{2}} .\pi = i\pi \right\rangle$; this is at the 'Rcb' = 0, the sub-quantum-scale.

For $\smile 2 \;\Rightarrow$ e xp $\left\langle \left\{+\left(k_{de}\right)^{\frac{1}{2}}\right\} .\pi \right\rangle$; this is at the 'Rcb' = ½, the quantum-scale.

For $\smile 3 \;\Rightarrow$ e xp $\left\langle + \left\{\left(k_{de}\right)^{1}\right\} .\pi \right\rangle$; this is at the 'Rcb' = 1, the micro-scale.

Where $k_{de} = \dfrac{c^5 O_e}{2\kappa}\left[\dfrac{m}{s^2}\right]$ for $G \le \kappa \le 1,$ where for $(\kappa = 1) \Rightarrow \left(k_{de}\right)^{\frac{1}{2}} = \left(\dfrac{c^5 O_e}{2\kappa}\right)^{\frac{1}{2}}\left[\dfrac{m}{s^2}\right] \approx$ 2.8…. x 10^{-14} [ms^{-2}], the lowest Newton-acceleration-limit at quantum-gravity-scale (femto-scale).

And where for $(\kappa = G) \Rightarrow \approx \dfrac{2.8\ldots..x10^{-14}\left[ms^{-2}\right]}{6.6x10^{-11}\left[Nm^2kg^{-2}\right]} \approx 0.42x10^{-3}\left[G.\dfrac{m}{s^2}\right]$, gravity on micro-scale.

The Riemann Zeta Function thus represents the sub-quantum, the quantum and the micro-gravity in the Double Torus Hypothesis.

The solution represents three values (0 , - ½ and 1) depending on 'own' $\smile$.

This is my solution of the Riemann Hypothesis. Is it solved? I think so, but others have to judge that too. I only can say: "May a creative judge look through with me, that the Big Bang is not the right cosmology after all, and that as well my new point of view in the Double Torus cosmology, as my solution of the Riemann hypothesis, may contribute to the near future".

The author: This paper contains physics-mathematical work owned by Dan Visser, M. Ruyshof 20, 1333 JL Almere, the Netherlands, Phone +31 36 54 99 701, email: dan.visser@planet.nl. It has been worked-out in the period from July 21 till August 4, 2013 and is based on the Double Torus Hypothesis, which is a new cosmological model for the universe.
I have send this paper to the Clay Mathematics Institute, because as far as I know a price is awarded for the one who solves The Riemann Hypothesis.

References and evaluation.

[1] http://www.vixra.org/author/dan_visser: An overview of the papers by Dan Visser, Almere, the Netherlands, about the Double Torus Hypothesis.

Evaluation

This evaluation walks in steps along the path of logic I used to get the Riemann Hypothesis related to the Double Torus Hypothesis (DTH).

2. I gave the Riemann critical band (Rcb) a physics-meaning that fits into the DTH.
3. The line x = ½ in the Rcb belongs to ½ O_e in the DTH, it half of the elementary quantum-surface. This ½ O_e is the line that divides the Rcb in sub-quantum recalculation of quantum-gravity and quantum-gravity. For $O_e = \pi.(r_{pl})^2$ follows π, for $r_{pl} = 1$
4. The values of 'x' on the x-axis represents extreme small accelerations in the Rcb.
5. Values of 0 < x < ½ perform a sub-quantum recalculation of quantum-gravity in the DTH.
6. Values of ½ < x < 1 perform quantum-gravity.
7. For x = ½ the acceleration starts with $G \leq \kappa \leq 1$, specifically for $(\kappa = 1) \rightarrow$

   $(k_{de})^{\frac{1}{2}} = \left(\dfrac{c^5 O_e}{2\kappa}\right)^{\frac{1}{2}} \left[\dfrac{m}{s^2}\right] \approx$ 2.8…. x 10^{-14} [ms^{-2}], which is the lowest Newton-acceleration-limit and generates quantum-gravity at femto-scale.
8. For x = 1 the acceleration starts with $G \leq \kappa \leq 1$, specifically for $(\kappa = G) \rightarrow$

   $\approx \dfrac{2.8.....x10^{-14}\left[ms^{-2}\right]}{6.6x10^{-11}\left[Nm^2kg^{-2}\right]} \approx 0.42x10^{-3}\left[G.\dfrac{m}{s^2}\right]$, generating gravity on micro-scale.
9. A special case is there for x = 0, where sub-quantum recalculation of quantum-gravity starts with $\left\{(-k_{de})^0\right\}^{\frac{1}{2}} = \{-1\}^{\frac{1}{2}} = i$.
10. The y-axis gets values e^x, where x represents the accelerations and π. For example $e^{i\pi}$. But also the other acceleration-states count.
11. All the numbers for (s) in the Riemann Hypothesis ξ(s), as well as the accelerations in the Rcb do have to participate. That means participation of the complex-numbers, the natural-numbers (+ and -), the real-numbers (rational and irrational) and the prime-numbers have to participate. This implies a product-configuration of a series.
12. So, I meet the serie of 'e' = 1/1 + 1/2 + 1/6 + 1/24 + …… with rational numbers and natural positive numbers.
13. So, I meet the Riemann Zeta function ξ(s) = 1 + $1/2^s$ + $1/3^s$ + $1/4^s$ + ……

    where π and $\sqrt{2}$ as irrational do participate.
14. So I meet ξ(s) = 1 / ($1\text{-}2^{-s}$) . 1/($1\text{-}3^{-s}$) . 1/($1\text{-}5^{-s}$) . 1/($1\text{-}7^{-s}$) . ……
    where the prime numbers participate as a series within the product-configuration.
15. And I meet $e^{i\pi}$ where *i* participates to form complex numbers.
16. In other words I have to combine 13 an 14. According to 9 the accelerations have to be an exponent of e, whereof $e^{i\pi}$ is one state. So, I have introduced my 'own' symbol ($\smile$= 'own') to represent the three basic acceleration-states.
17. I combine 13 and 15 by an equalization, because in that way a connection between physics and an arithmetical formula emerges, wherein all the accelerations participate, plus all the

numbers from $\mathbb{N}, \mathbb{Z}, \mathbb{R}, \mathbb{C}$, inclusive the prime-numbers. That is what I did in my paper of July 23 2013.

18. From that follows: $e^{\text{'own'}} = 1 / (1-2^{-s})\ .1/(1-3^{-s})\ .1/(1-5^{-s})\ .1/(1-7^{-s})\ \ldots$
    This series with prime-numbers and all numbers for (s) is the result of a function ‘e’, where the accelerations are variable over the complete Rcb and have a connection with all the numbers of (s). The ‘own’ and (s) relate directly to physics (subqu, qu and micro) and numbers.
19. But also the demand of Rho $_{vac}$ = 0 in the DTH leads to $e^{\text{'own'}}$ + 0 = 0, or +1/2 = 0, or +1 = 0
20. So that also follows for ξ(s), which leads to ξ(s) = 0, or = - ½, or = - 1 This all depends on ‘own’.
21. So for (s) in ξ(s) may be substituted $\smile$. Thus (S = $\smile$) .
22. From this follows: $e^{\text{'own'}} = 1 / (1-2^{-\text{‘own’}})\ .1/(1-3^{-\text{‘own’}})\ .1/(1-5^{-\text{‘own’}})\ .1/(1-7^{-\text{‘own’}})\ .\ \ldots$
23. $\smile$ comprehends the whole range of accelerations depending on $G \le \kappa \le 1$ in
    $\left(k_{de}\right)^{\frac{1}{2}} = \left(\frac{c^5 O_e}{2\kappa}\right)^{\frac{1}{2}} \left[\frac{m}{s^2}\right].$

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