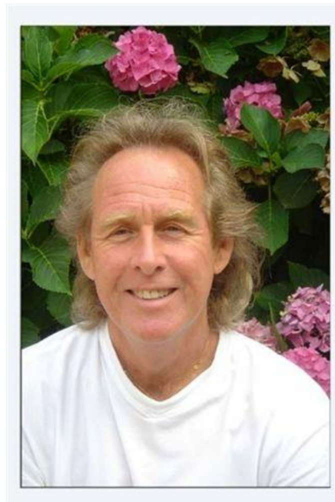
Thought-experiment provides a formula for (new) dark energy force (version-3).



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Publication-dates: Version-1 was submitted in October 7 2010, in retrospective to the first paper of Dan Visser and Christopher Forbes in the Vixra-archive about a possible new cosmology. Then version-2 needed a textual revision after the publication of several new papers, wherein I gave a better explanation without altering the mathematical content of the original ‘dark energy force-formula’. Version-3 again needed a better textual explanation for the benefit of entropy-gravity, of course without altering the mathematics.

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Abstract.

A (new) ‘dark energy force-formula’ was introduced on April 10 2004 by Dan Visser, Almere, the Netherlands on his website (reference 1a). The (new) formula was picked up by a PhD-mathematician and -Physics, Christopher Forbes (UK), in the summer of 2009, leading to email-contact among them, and resulting in a publication of a general mathematical expression, whereof Dan’s (new) ‘dark energy force-formula’ indeed resulted from the general expressing (reference 2). Additional an amount of (new) dark energy resulted too. Afterwards Dan published his derivation of the (new) force in the Vixra-archive on October 7 2010 (in retrospective). He called his mathematical exercises a ‘thought-experiment’. That had as result the (new) ‘dark energy force-formula’. In the versions following (version-2 and -3) only textual changes were made for servicing a better understanding of the thought-experiment, of course without altering the original mathematical content. Further development was focussed on working–out the (new) dynamics in the Double Torus hypothesis. This is a hypothesis that claims the Big Bang cosmology can no longer be maintained as the model for the universe. The main issue in

‘Dan’s-thought-experiment’ is a scaling-away-principle’,which is characterized by ‘scaling-away’ two black holes from each other (small and large), as well as ‘melting them together’ and making them ‘temperature connected’. Then an observer would receive the same evaporation-radiation from both black holes at the same time. These three exercises (scaling-away, melting-together and temperature-connection) had the aim to keep entropy conserved in the universe. However, ‘scaling-away’ causes a ‘change of dark information’ at the surface of one or the other black hole. Such a change had to correspond to a ‘new force’. That was further exercised, analyzed, synthesized, combined and translated as a mathematical thought-experiment. The result: Dan’s (new) ‘dark energy force-formula’.

Introduction.

My thought-experiment was described in April 4 2004 and put on my website on April 10 2004. The revision of version-1 was October 7 2010 and was aimed on a better textual-explanation, without altering the mathematical ‘thought-experiment’. Still the fundamental mathematical derivations are unchanged and still actual.

I started with Hawking's prediction of 1974, who claimed a large black hole could evaporate very slowly and a small black hole, called a Planck hole - which is the smallest possible black hole in Big Bang cosmology - would evaporate in a flash. I had a faint idea that such a process might introduce 'extra time’, so I started writing my simple mathematical derivations, which became ‘my thought-experiment’.

I combined the ‘scaling-away’ of a small- and large black hole ‘from each other’, while an observer had to be capable of receiving equal amounts of evaporation-radiation from both black holes at the same time. Although the evaporation-radiation was assumed to be thermic-radiation, I had a the idea it should affect 'dark information' probably by ‘extra time’.

In my vision the ‘scaling-away principle’ changed the 'dark-information' at the surface of these black holes. So ‘such a scaling-away movement’ should cause the ‘same change’ of dark information’. In order to get two equations with one unknown ‘dark information-change’ parameter, and ‘melting them together’, while connecting them in temperature, could achieve that ‘conservation of entropy’. So, I translated this in a mathematical exercise, which I called my ‘thought-experiment’. The result was my (new) ‘dark energy force-formula’.

It was a different force from forces known in the Big bang cosmology, because a ‘time-extension’ was introduced. That implied the introduction of a wider universe. Then my)new) force was picked-up from the internet (from my website) by Christopher Forbes (UK) in the summer of 2009. He identified himself as a British PhD mathematician and physicist (also Fellow of the Royal Astronomical Society). Soon he came forward with a general mathematical equation, whereof my (new) ‘dark energy force formula’ appeared to be a solution! But also an amount of (new) dark energy came out of the equation. Besides, my dark energy force formula appeared to have a ‘+’ and (‘-‘) sign. My ‘scaling-away-principle’ could be associated with the ‘-‘ sign, so the ‘+’ sign must have the meaning of ‘scaling-getting-closer’. I had not recognized that during the exercise of my thought-experiment. So, Forbes and I decided to publish the results in the Vixra-archive in co-authorship. That publication was of September 1 2009, followed by two other publications in co-authorship. The rest of the publications afterwards, I did on my own in a solitary way without any connection to any institute. The publications convinced me of additional theoretical evidence for the existence of a wider universe than the Big Bang. However, although my website already comprehended the derivation of my (new) 'dark energy force formula', I decided to publish my 'dark energy force formula' in the Vixra-archive afterwards (or so to say: in retrospective) in order to synchronize our actions and future developments: Reference: http://vixra.org/abs/1010.0013). All the papers published afterwards were of my hand only, because my contact with Christopher Forbes 'faded away slowly' (since 2010, and ending in the beginning of 2011). One of his last messages to me gave me still hope he would be the one to formulate an extensive mathematical framework, called the *Triple Torus Topology* ('triple' because mathematical boundaries should determine the physical boundaries), or the *Forbes-Visser Model (F-V model).* However, until now I have never heard of him since.

So, I 'scaled away' from each other two differently sized black holes, a small and a large one, in order to obtain an equal amount of evaporation-radiation from both, in order to make possible a simultaneous detection by an observer. The evaporation-radiation exists of Hawking-radiation, which is related to S=¼ A; S is the entropy and A the amount of Planck-surfaces. Hawking claimed his radiation is thermic.

However, quantumdynamics demands that information can never been lost in the universe, even after having been disappeared in black holes. Although this is acknowledged by theoretical analysis, it is a paradox to some scientists. However, new mathematics in loop-quantum-gravity also postulates that the forces in the atom forbid the forming of singularities (a singularity is just an infinite small point with an infinite large energy).

That means that 'fundamental information' should be maintained in the universe. However, whether this is a paradox or not, it is not relevant for this 'thought-experiment'. The purpose is to "scale-away" black holes from each other for finding a new dynamical action, which I named: "dark energy force". The 'dark energy force' might reveal sub-quantum-information. Maybe it could be 'fundamental information by 'time affecting quantum-gravity'. 'Sub' in this context means information from below the Planck scale.

The only fundamental way to measure 'scaled away black holes from each other', is by their 'temperature'! We are also used to do this with light. Every light-wave has its own typical temperature. However, Hawking-radiation is rather difficult to observe. So, I used a 'refined chance-principle' connected to 'temperature, which I implemented in the rest of the exercise.

The issue here is thus: An observer sees the same entropy for both black holes. However, not without excitation of a 'new force'. In fact it is the conservation of entropy and that cannot be reach without a 'new force'. The force is 'dark'. So: A new dark energy force.

One can ask: Why would you do that? Well, In the beginning of a Big bang the entropy must have been maximal, but at the end of an ever expanding space-time after the Big Bang the entropy is maximal again. So it looks as if the entropy in the beginning was the end of the entropy of a Big Bang that happened before. In some way entropy seemed to be conserved. Anyhow, that was my motive. But I couldn't express this in version-1.

Whatever, from another historical perspective movement of energy was observed as 'going from warm to cold areas', but new insights learned that 'lost information' was defined at the surfaces of event-horizons of black holes. More 'lost-information' inevitably would lead to a higher entropy (S). Hawking derived this as $S=4(pi)m^2$, where (m) is the mass of the black hole. This can be rewritten, as follows:

The surface of a globe is $A=4(pi)r^2$, with r=2m, where r is the radius of the event-horizon. The result becomes $A=4(pi).(2m)^2=16(pi)m^2$. Comparing this with $S=4(pi)m^2$, we find **S=1/4 A** (where A is the amount of Planck surfaces). However, entropy must be without dimensions, so (S) must be divided by the elementary Planck-surface O_e.
Meanwhile the event-horizon of a black hole becomes smaller, due to the evaporation of its surface. Small black holes evaporate faster and more intensively than large ones. The temperature of the black hole (T_s) is proportional to the gravity of a black hole: $T_s \sim F_z \sim m/r^2 \sim m/m^2 \sim (1/m)$.

Starting the 'thought-experiment'.

Preface-remark: Because I didn't have a program for writing formulas I wrote my formulas in word. From a point of view of authenticity I remained that in version-2 and 3.

I took the following *product:*

[a light-way (ct) from myself up to the light-horizon of a black hole] x [the distance ($s = 0,5\ r_s$) from the light-horizon up to the event-horizon of the black hole in order to "observe" the evaporation of two black holes simultaneously (large and small) through a kind of entanglement within the observer].

It is not possible to look beyond the light-horizon of a black hole, but still there must be an unknown chance to observe this, and even a more deeper chance.
This "chance" is (ct).(s) / (ct) + (s). However, within a black hole the total of comparable chances are (ct) + (s) = 1, so the chance will be (ct).(s). This could carry out "more detailed chances" than is known from quantum mechanics.

Therefore I relate the "temperature" to this chance (ct).(s):
$T_s \sim ct\ .\ 0.5\ r_s$ (1)

However, this chance must be also combined with $T_s \sim 1/m$ to connect with the temperature of a black hole as a complete physical system. The result is:

$T_s \sim (ct.\ 0.5\ r_s).\ 1/m$

From this follows:

$ct \sim (2\ m/r_s).\ T_s$

From this follows:

$ct \sim 2.\ (1/2.c^2/G)\ .\ T_s$
$ct \sim c^2/G\ .\ T_s$ (2)

According to $S=4(pi)m^2$, the entropy S at the surface of a black hole is proportional to m^2. This means as soon as two equally sized black holes form one black hole, the event-surface becomes 2x larger, while the mass only increases with a factor $2^{1/2}$. I call this effect 1, which propagates $(2 - 2^{1/2})$ m = 1.4 m. This affects (ct) to the observer.

Intermezzo:

On the other hand this effect leads to a specific analysis of dark energy and dark matter. I call this: effect 2. I take the ratio of the black hole surface A and the black hole mass m, defined as A/m. This ratio A/m is constant for as well a single black hole as for two black holes put together. According to the afore effect 1, the ratio becomes larger with a factor 1.4, only if the two black holes are put together. Compared to the original ratio then follows: 1.4 (A/m) - A/m = 0.4 =40%. This 40% had to escape via the black hole surface, leaving behind 60% in the larger black hole. The escaping energy must be dark energy with an anti-gravitational property. So, an anti-gravitational dark energy 40/60 = 2/3 stays connected to the combined black holes. Consequently 1/3 must be identified as dark matter with a gravitational property.

Conclusion: The basic ratio of dark energy / dark matter is defined as 2 : 1. This means 66% is dark energy and 33 % is dark matter. The fact that nowadays 73% dark energy is observed (calculated) and 23% dark matter (observed and calculated) is due to an unknown dynamic in the big bang. This includes that the big bang also might be part of another cosmological model.

Back to the effect 1, this results in:

$ct \sim m.(2 - 2^{1/2})$ (3)

Now both sides in expression (3) are divided by r_s (the Schwarzschild-radius):

$ct/\ r_s \sim (m/r_s\ ).(2-2^{1/2})$

and because m/r_s can be rewritten in 1/2 (c^2/G), the result is:

$ct/\ r_s \sim 1/2\ (c^2/G)\ .\ (2-2^{1/2})$
$ct/\ r_s \sim c^2/G - \{(0.5\ .2^{1/2}).\ c^2/G\}$
$c^2/G \sim ct/\ r_s + \{(0.5\ .\ 2^{1/2}).c^2/G\}$

substitution in 2 results in:

$$ct \sim \left\{ \frac{ct}{r_s} + \frac{(0.5 \, . 2^{1/2}).c^2}{G} \right\} . T_s$$

$$ct \sim \frac{T_s \, ctG + r_s \, T_s \, (0.5 \, .2^{1/2}).c^2}{r_s \, G}$$

$$ct \sim \frac{2T_s \, ctG + r_s \, T_s \, c^2 \, 2^{1/2}}{2r_s \, G}$$

$$2 \, r_s \, G \, ct \sim 2T_s \, ctG + r_s \, T_s \, c^2 \, 2^{1/2}$$
$$2 \, r_s \, G \, ct - 2T_s \, ctG \sim r_s \, T_s \, c^2 \, 2^{1/2}$$
$$2t \, (r_s \, G \, c - T_s \, c \, G) \sim r_s \, T_s \, c^2 \, 2^{1/2}$$

$$2t \sim \frac{r_s \, T_s \, c^2 \, 2^{1/2}}{r_s \, G \, c - T_s \, c \, G}$$

$$t \sim -\frac{r_s \, T_s \, c^2 \, 2^{1/2}}{2 \, G \, c \, (r_s - T_s)} \qquad (4)$$

This is time (t) to observe evaporation-radiation from both black holes. Whether this is a large or small black hole depends on r_s and T_s. For $r_s >> T_s$ (which is a large black hole) follows:

$$t \sim \frac{0.5 \, c \, 2^{1/2} \, .T_s}{G}$$

The restriction means: $r_s = 2mG/c^2 >> T_s$, so, $m >> 0.5 \, . \, (c^2/G) \, . \, T_s$.
But because $T_s \sim 1/m$ than follows $m >> 0.5 \, . \, (c^2/G) \, . \, 1/m$.
So, than the restriction changes in :
$m^2 >> 0.5 \, . \, (c^2/G)$ which means $m^2 >> 0.5 \quad .1.36 \quad .10^{27} >> 0.068 \, . \, 10^{28}$
This means one sun-mass of 2.10^{30} [kg] imagined as a black hole, is a large black hole. The time (t), with the restriction of $T_s \sim 1/m$, results in:

$$t \sim \frac{0.5 \, c \, 2^{1/2}}{mG} \qquad (5)$$

The dimension is $[m/s] /\{[kg].[m^3/kg.s^2]) = [s/m^2]$.
So, to translate time in seconds (this means to enable observation in reality), a

multiplication is necessary with the unity of a black hole-surface, which is an elementary surface quantum O_e [m²]. From this follows:

$$t = \frac{0,5\ c\ 2^{1/2}}{mG} \cdot O_e\ [s]$$

O_e can be replaced by $(L_{planck})^2 = hG/c^3$

$$t = \frac{0.5\ c\ 2^{1/2}}{mG} \cdot \frac{hG}{c^3}\ [s]$$

From this follows:

$$\mathbf{t = 0.5\ .2^{1/2} \cdot \frac{h}{mc^2}\ [s]} \qquad \textbf{(6)}$$

So here is the time to have a unknown chance of observing radiation of a large black hole. This is determined by Planck's constant (h) and Einstein's energy E= mc². This was expected. Then the other restriction $r_s << T_s$.

Now I define time as (t'), because in principle, it is different from time (t).

Then starting again from formula (4):

$$t' \sim \frac{0.5\ c\ 2^{1/2}\ r_s\ T_s}{G\ (r_s - T_s\ )}$$

Now the case is: r_s can be neglected to T_s (a small black hole):

$$t' \sim \frac{0.5\ c\ 2^{1/2}\ r_s\ .T_s}{G\ .\ (-\ T_s\ )}$$

$$t' \sim -\ 0.5\ r_s \cdot \frac{c\ 2^{1/2}}{G}$$

In this I substitute $r_s = 2mG/c^2$.

$$t' \sim -0.5 \cdot \frac{2mG}{c^2} \cdot \frac{c\ 2^{1/2}}{G}$$

$$t' \sim -\ \frac{m\ 2^{1/2}}{c}\ [kg]\ /\ [m/s] =[(kg/m).s]$$

Again (t') must be expressed in seconds, but now for a small black hole.
So, it must be divided by *the dimension of mass-density [kg/m*]. But by what value?
The is this: a small black hole exists, when a Planck-mass and light, are both present at the same time, so $(hc/G)^{1/2}$ [kg] . c [m/s] is actual. Moreover the Planck-mass is defined at the Planck-length, so also (1/c). $(hG/c)^{1/2}$ .c [m.(m/s)] = $(hG/c)^{1/2}$ [(m/s).m] must be actual.
To get a volume [m^3] of a small black hole per second, $(hG/c)^{1/2}$ [(m/s).m] must be taken per 1 m/s, or multiplied by 1 [s/m].

The result is $(hc/G)^{1/2}$ [kg] / {$(hG/c)^{1/2}$ [(m/s).m] .1 s/m}]= $(hc/G)^{1/2}$. $(hG/c)^{-1/2}$ = c/G [kg/m]. So, to get the time (t') for a small black hole, there must be divided by c/G [kg/m], or multiplied by G/c [m/kg]. This will express (t') in seconds. The result is:

$$t' = - \frac{m\, 2^{1/2}}{C} \,.\, G/c \text{ [s]}$$

$$\mathbf{t' = - \frac{m\, G\, 2^{1/2}}{c^2} \text{ [s]}} \qquad \textbf{(7)}$$

Now the time to observe a small black hole is determined by G and c^2 , while m must be negative to get positive time. This defines my information sub point-particles in my dark-field, where -m is the returned-information of small black holes.

After having found two time-durations for observing a small and large black hole, I introduce the duo-time factor, called DQT-factor, which means both time-durations will be connected. The 'Q' stands for a detailed chance below Quantum-level.
I have found two times (t) en (t'), which connect to E x t' working opposite to E x t .

The result is:

$$DQT = - \frac{G\, 2^{1/2}}{c^2} \,.\, m.\ 0.5\ .2^{1/2} \,.\, \frac{h}{mc^2}$$

This can be rewritten:

$$DQT= - \frac{G\, c\, 2^{1/2}}{c^3} \,.\, m.\ 0.5\quad .\ 2^{1/2} \,.\, \frac{h}{mc^2}$$

This makes possible to replace (hG/c^3) [m^2] in O_e [m^2]. So than follows:

$DQT= - m\ .\ O_e\ .\ c.\ 1/mc^2$
$\mathbf{DQT= - O_e /c}$ **[m.s]** **(8)**

Intermezzo: Could both times ever be equal to each other? No ! Accept in an empty *universe, or a universe which hasn't started yet. I will show this:*

$$- \frac{G\, 2^{1/2}}{c^2} . m = 0.5\, .2^{1/2} . \frac{h}{E}$$

$$0.5\, .2^{1/2} . \frac{h}{mc^2} + \frac{G\, 2^{1/2}}{c^2} . m = 0$$

$$\frac{0.5\, .2^{1/2} . h . c^2 + Gmc^2 . 2^{1/2}}{c^2\, mc^2} = 0$$

$$\frac{c^2(0.5\, .2^{1/2} . h + Gm.)\, 2^{1/2}}{c^2\, mc^2} = 0$$

$$\frac{2^{1/2}\,(0.5h + Gm^2)}{mc^2} = 0$$

With the restriction of $Gm^2 >> 0.5h$, or let us say $Gm^2 >> hc$, or $m^2>>hc/G$, or $m^2>> m^2_{Planck}$ this is giving the following derivation:

$$\frac{2^{1/2}\, Gm^2}{mc^2} = 0$$

$$\frac{2^{1/2}\, Gm^2}{mc^2} = 0$$

$$\frac{G\, 2^{1/2}}{c^2} . m = 0$$

This can only be for m = 0. Thus only both times can be equal if there are no masses. This means both times are only equal for small black holes, which loose all their radiation. Under these circumstances there are no blackholes to give radiation.
And in the other case:

$$\frac{2^{1/2}\,(0.5h + Gm^2)}{E} = 0$$, with $Gm^2 << 0,5h$, follows:

$$\frac{0.5 \cdot 2^{1/2} \cdot h\ [J.\ s]}{E\ [J]} = 0\ [s]$$

In this expression there is energy E in the dimension [J], so in the expression $0.5 \cdot 2^{1/2} \cdot h$ [J. s] = 0 only the time can be 0. If E=0 and the time is finite, than the result would be infinite, but that is not the case, it is 0. So "the time dimension must be = 0", and that means the universe had not yet started. *Anyway this also proves that the universe had a finite energy before it started***.**

Now I continue:

Both times cannot be equal to each other. It always demands a DQT-factor to be a product, which gives an unknown chance to observe the radiation after a time (t') and (t), for a small and large black hole. I substitute the DQT-factor in the product of energy and time: U = (E x t) . (E x –t') = E^2 . t.-t' = E^2. DQT = E^2 . - O_e /c [J^2.m.s] =[$(J.s)^2$.m/s].
Those two forms of "energy x time", symbolize the 100 % unknown chance of observing a large and small black hole simultaneously. This co-existence of two different black holes in one moment, means: Obtaining an energy (U) for one black hole, for which (U) has to be divided by 2, as follows:

$U = 0.5 \cdot E^2 \cdot - O_e /c = E^2 \cdot - O_e /2c$ [J^2.m.s] =[$(J.s)^2$.m/s]

The energy (U) is a temporal energy from below quantum-scale, because the source of the energy is normally from inside the black hole. Therefore (U) has anti-gravitational features. Thus, to get a real presentation of the new energy, I have to accept the existence of E and U together at "the same time".
In other words: The Cosmos exists of having a chance to be involved with Einstein's energy and the returned information from an unknown energy force. This is resulting in the next equation:

$U_u = E \cdot U = mc^2$ [J]. E^2. - O_e /2c [J^2.m.s]

This introduces:

My dark energy force formula:
$U_u = - 0.5 \cdot E^2 \cdot mcO_e$ [J^3. m.s] = [$(J.s)^3$.m/s^2] = [$(kg)^3$.m^7/s^5] **(9)**

In this formula $E^2 = E^2_{kin} + E^2_0$ is embedded. There is also a dark matter impulse (mc) as part of a dark matter flow (1/2 mc O_e) [kg.(m^3/s)]. In total the sign is "-", which means there is a repulsive gravitational property: dark energy force.

The dimension [$(J.s)^3$.m/s^2] shows a three dimensional spin (J.s), which accelerates (m/s^2). This represents a force in a torus geometry of dark energy and dark matter.

Moreover, my formula can be rewritten furthermore in:

$U_u = -0.5 \cdot E^2 \cdot mcO_e$ [(kg)³.m⁷/s⁵]
$U_u = -0.5\, m^3c^5O_e$ [(kg³.(m³/s)] . 1 [m⁴/s⁴]
$U_u = -0.5\, m^3c^5O_e$ [(kg³.(m³/s)] . 1/G [N] (10)

From this follows:

dark energy force formula:
$U_u = -\,(c^5O_e/2G) \cdot (m)^3$ [(kg.m)³.N/s] (11)

Here c is the light-speed, G is the Newton-constant, $O_e = (L_{planck})^2$ and m is mass.
Control of the dimensions:

$\{[m^5/s^5] \cdot [m^2]\} / \{[m^3] / [kg.s^2]\}\ [kg^3] = \{[kg^3]. [m^7/s^5]\} \cdot \{[kg.s^2] / [m^3]\} = [kg^3]. \{[kg] \cdot [m^4/s^3]\} = [kg^3]. \{[kg] \cdot [m/s^2]. [m^3/s] = [kg^3]. N \cdot [m^3/s] = [kg^3 \cdot m^3] \cdot [N/s] =$
$[(kg \cdot m)^3] \cdot (N/s)]$

References:

[1] "Thought-experiment and formulas" are designed and owned by Dan Visser, Almere, Netherlands, First published on April 10, 2004 in my website [1a]
Text modifications were made on July 18 2004, September 18, 2005 and March 31 2008, April 5 2008 and April 19 2008, September 28 2008, September 21 2010, September 28 2010 and October 7 2010. Dan Visser, email dan.visser@planet.nl ;

[1a} website www.darkfieldnavigator.com

[2] viXra:0909.0005 [pdf], "Short Article On A Newly Proposed Model Of Cosmology", submitted on Sep 1, 2009 in the category "Relativity & Cosmology"; viXra:0910.0016 [pdf], "Mathematical and Phenomenological Elements of the Twin-Tori Model of Physics and Cosmology", submitted on October 11 2009 in the category "Mathematical Physics"; viXra:0911.0061 [pdf], "A New Quantum Gravity Framework Based on the Twin Tori Model of Cosmology. (Part 1), submitted on November 28 2009 in the category 'Astrophysics'.