Calculation of Everything - The Universe

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Abstract In previous studies, from our originative method for the integration of four fundamental forces, dark energy ratio was calculated as 72.916%. In this study, dark energy ratio was calculated as 72.9138% and 68.5741% by our originative idea and formula. Additionally, from gravitational constant G 6.67430E-11 m3/kg1s2, cosmological constant was calculated as 1.106169E-52 /m2, age of universe as 13.784 BY, and Hubble parameter as 67.833 km/s/Mpc and 72.777 km/s/Mpc. Simultaneously with the above results, the radiation density of 9.117E-5 (= CMBɣ 5.408E-5 + CNBν 3.708E-5) was calculated, and the value of 13.784E9Y x 5.408E-5 / 2 is 372,700 years. The following very important results were obtained from this study. Dark energy ratio is the constant regardless of time flow, and cosmological constant is parameter of time flow such as Hubble parameter.

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1. Introduction

In Fig. 16 of previous study [1], dark energy was calculated as 72.916% from the integration of four fundamental forces. The purpose of this study is to newly calculate the dark energy ratio from our original cosmological perspective. In the many formulas of Fig. 1, only gravitational constant G 6.67430E-11 m^3/kg^1s^2 is the input value, and all other formulas and values are developed in this study.

2. Planck 2018 Results

2.1 Dark energy: 72.8% vs 68.57%

Planck results are presented in Fig. 1(a). The core among them is dark energy ratio, and Before Planck (2012) is 72.8% and Planck 2018 Result is 68.57%. The difference between the two numbers is very large. Which one is correct? The product of the two numbers is 1 / 2.003. Why is it almost the same as 1 / 2? If this is correct, it can be understood that both values are correct. $H_{1/\mathrm{Age}}$ is the Hubble constant when the universe is expanding at a constant velocity. For example, let's remember Hubble constant of 67.66 km/s/Mpc, cosmological constant of 1.1056 /m2, universe age of 13.787 BY, and constant expansion of 70.92 km/s/Mpc.

2.2 Cosmological constant problem

As shown in Fig. 1(b), the cosmological constant problem is that the product of square of Planck length l_P 1.61626E-35 m and cosmological constant Λ 1.1056E-52 /m^2 becomes an incomprehensible value 1E-121.5. In section 3.18 and 5.23 of Ref. [1], it was calculated that the value is equal to the ratio of 0D neutrino mass to 3D neutrino mass. That is, l_P is the value of 0D, and Λ is the value of 3D. It is obvious that multiplying $l_{\mathrm{P}0}$ and Λ_3 yields a value that does not exist in physics. Quantum mechanics is the interpretation of 0D, and cosmology is the interpretation of 3D. Therefore, if the dimensions match, the value of $l_{P3}^2 \cdot \Lambda_3$ becomes exact 1. $l_{\mathrm{P}3}$ means the cosmic Planck length. Let's denote this as r_Λ. The formula is simplified into ①, and t_Λ is calculated as 10.053 BY.

3. Dark Time

3.1 Quantum hole

As shown in Fig. 2, Quantum Hole is a hole that quantizes 4D space, and the author has continuously proposed it from previous studies. Quantum hole of 4D has the characteristics of black hole of 3D, but the difference is that quantum hole is anti-matter, and it is 2π times heavier than matter.

3.2 Quantum matter : Event horizon = 1 : 2

Fig. 2 is the shape of Quantum Hole, and our 3D universe is located between the 4D Event Horizon and 4D Quantum Matter. 4D quantum matter is a superconductor that floats the 3D universe in the empty space and expands it to the limit, and the 4D event horizon shrinks the 3D universe to the limit. This causes our 3D space to unfold in the between, and our 3D universe unfolds along the parallel lines of the two forces. It is necessary to calculate what will happen if two superconductors are pushed to their limits, which can help understand Fig. 1. It is well known that the relationship between Planck length l_P and Schwarzschild radius r_s is 1 : 2. Therefore, l_{P3} : r_{s3} = 1 : 2 also is established. Here, l_{P3} (= r_Λ) is the radius of 4D quantum matter, and r_{s3} (= $2t_\Lambda$) is the radius of 4D event horizon.

(a) **Before Planck** Ω_Λ $\boxed{72.8\%}$ 2012

Planck 2018 Results	Ω_Λ	H_0 km/s/Mpc	Λ E-52/m2	Age BY	$H_{1/Age}$
TT,TE,EE+lowE	0.6834±0.0084	67.27±0.60	1.0842	13.800±0.024	70.86
TT,TE,EE+lowE+lensing	0.6847±0.0073	67.36±0.54	1.0892	13.797±0.023	70.87
TT,TE,EE+lowE+lensing+BAO	0.6889±0.0056	**67.66**±0.42	**1.1056**	**13.787**±0.020	**70.92**
Avg.	$\boxed{68.57\%}$	67.43	1.0930	13.795	70.88

※ 72.8% x 68.57% = **1 / 2.003**

(b) **Cosmological Constant Problem** $l_{P0}^2 \cdot \Lambda_3$ = 1E-121.5 = v_0^C / v_3^C (1.61626E-35, 1.1056E-52) ☞ $l_{P3}^2 \cdot \Lambda_3 = 1 = v_3^C / v_3^C$ (Ref[1] 5.23) ※ Q.M. 0D vs Cosmology 3D

$l_{P3} = r_\Lambda$ ※ What is Λ? ☞ $r_\Lambda = 1/\sqrt{\Lambda}$ $t_\Lambda = 1/c\sqrt{\Lambda}$ ① 1 / 2.9979E8 · 60 · 60 · 24 · 365.24 · √1.1056E-52 = t_Λ = **10.053E9 LY**

(c) **Dark Time [Q]** $(1/\alpha - 1) = (t_C - t_\Lambda) / t_\Lambda \equiv \omega_Q^\alpha$ = **37.14%** **62.86%** = $\omega_E^\alpha \equiv (2t_\Lambda - t_C) / t_\Lambda$ = (2 - 1/α)

Dark Energy Ratio [Q]

0 —— t_Λ 10.053 Quantum Matter —— Inside, Past, CMB [Q]uantum State 3.734 / 10.053 —— t_C 13.787 Universe —— Outside, Future, Redshift [E]vent State 6.319 / 10.053 —— $2t_\Lambda$ 4D 20.106 Event Horizon

② $\alpha \equiv \Omega_Q = t_\Lambda / t_C$ = 72.915% (72.8% 72.916%)

$[C] = [Q] \cdot \omega_Q + [E] \cdot \omega_E$ ③

[C]ombined State = [Q] · 37.14% + [E] · 62.86% [C] Hubble = [Q, CMB] 67.66 · 37.14% + [E, Redshift] 73 · 62.86% = 71.0 (constant velocity expansion)

$\overrightarrow{\Omega_C^\alpha} = [Q] \cdot \omega_Q^\alpha + [E] \cdot \omega_E^\alpha = \alpha \cdot (1/\alpha - 1) + 1/2\alpha \cdot (2 - 1/\alpha) = 1 - \alpha + 1/\alpha - 1/2\alpha^2$ ④ 70.19% forward

72.915% x 68.572% = 1 / 2

$\overleftarrow{\Omega_C^\alpha} = [Q] \cdot \omega_E^\alpha + [E] \cdot \omega_Q^\alpha = \alpha \cdot (2 - 1/\alpha) + 1/2\alpha \cdot (1/\alpha - 1) = 2\alpha - 1 + 1/2\alpha^2 - 1/2\alpha$ ⑤ 71.30% reverse

$\Omega_Q \cdot \Omega_E = \alpha \cdot \beta = 1/2$ ⑦

(d) **Dark Time [E]** $(1/\beta - 1) = (2t_\Lambda - t_C) / t_C \equiv \omega_Q^\beta$ = **45.83%** $(2t_C - 2t_\Lambda) / t_C \equiv \omega_E^\beta$ = **54.17%** = (2 - 1/β)

Dark Energy Ratio [E]

0 —— t_C 13.787 Universe —— [Q]uantum State 6.319 / 13.787 —— $2t_\Lambda$ 20.106 Event Horizon —— [E]vent State 7.468 / 13.787 —— $2t_H$ 27.574 What?

⑥ $\beta \equiv \Omega_E = t_C / 2t_\Lambda$ = 68.572%

[C]ombined State = [H] · 45.83% + [W] · 54.17% [C] Hubble = [H, CMB] 67.66 · 45.83% + [W, Redshift] 73 · 54.17% = 70.4

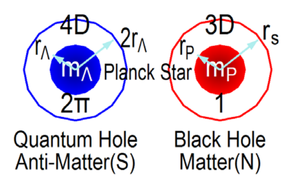
$\overrightarrow{\Omega_C^\beta} = [H] \cdot \omega_Q^\beta + [W] \cdot \omega_E^\beta = \beta \cdot (1/\beta - 1) + 1/2\beta \cdot (2 - 1/\beta) = 1 - \beta + 1/\beta - 1/2\beta^2$ ⑧ 70.93% forward

$\overleftarrow{\Omega_C^\beta} = [H] \cdot \omega_E^\beta + [W] \cdot \omega_Q^\beta = \beta \cdot (2 - 1/\beta) + 1/2\beta \cdot (1/\beta - 1) = 2\beta - 1 + 1/2\beta^2 - 1/2\beta$ ⑨ 70.56% reverse

(e) **Dark Matter** Our universe is inside of 4D Quantum Hole Ref[2] Fig1 $m_S = 2\pi \cdot m_N$ Ref[1] 8.2

Planck mass $m_{P0} = c^2 \cdot l_{P0} / G$ ☞ $m_{P3} = c^2 \cdot l_{P3} / G$ ☞ Planck 3D mass [S] $m_\Lambda = 2\pi \cdot c^2 \cdot r_\Lambda / G$ ⑩

Schwarzschild radius $r_s = 2 \cdot G \cdot m_P / c^2$ ☞ $r_s = 2r_P$ ☞ Planck 3D mass [N] $m_P = 1 \cdot c^2 \cdot r_P / G$ ⑪



Planck 2018 Results: Dark energy : Dark matter : Ordinary matter = 68.89% : 26.19% : 4.92%

WIKIPEDIA: Observable universe: Ordinary Matter is about 1.5_ E53 kg

☞ Dark matter = 1.5_E53 kg x 26.19% / 4.92% = 8.0_E53 kg

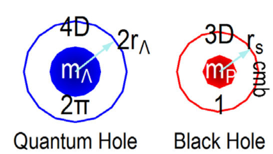
⑩① $m_\Lambda = 2\pi \cdot c^2 / \sqrt{\Lambda} / G = 2\pi \cdot 2.9979E8\text{^}2 / \sqrt{1.1056E\text{-}52} / 6.6743E\text{-}11$ = 8.05E53 kg (Quantum Matter)

(f) **Dark Energy** Relationship of cosmological constant, Hubble constant, dark energy ratio

3D Volume of 4D Q.H. = Surface area of 4D sphere = $2\pi^2 \cdot r^3 = 2\pi^2 \cdot (2r_\Lambda)^3$ ⑫

3D Density of 4D Q.H. $= \dfrac{\text{Mass}⑩}{\text{Volume}⑫} = \dfrac{2\pi \cdot c^2 \cdot r_\Lambda / G}{2\pi^2 \cdot (2r_\Lambda)^3} = \dfrac{c^2 \cdot G}{\pi \cdot 8 r_\Lambda^2} \overset{①}{=} \dfrac{\Lambda c^2}{8\pi G} \overset{5.9E\text{-}27}{=} \rho_\Lambda$ ⑬

Schwarzschild radius formula 3D Density of 3D B.H. $= \dfrac{\text{Mass}}{\text{Volume}} = \dfrac{c^2 \cdot r_s / 2G}{4\pi/3 \cdot r_s^3} = \dfrac{3 \cdot c^2 / r_s^2}{4\pi \cdot 2G} \overset{1/t_s}{=} \dfrac{3H_s^2}{8\pi G} = \rho_c$ ⑭



First Friedman Equation

Dark energy ratio: $\Omega_\Lambda = \dfrac{\rho_\Lambda}{\rho_c} = \dfrac{\Lambda c^2}{3H_s^2} \begin{matrix} >1 \\ =1 \\ <1 \end{matrix}$ ☞ $\Lambda = 3 \cdot \left(\dfrac{H_s}{c}\right)^2 \cdot \Omega_\Lambda$ ⑮ (1.1056E-52, 2.9979E9, 67.66 / 3.08568E19, 68.89%) ☞ $\Lambda_C^① = 3 \cdot \left(\dfrac{H_{cmb}^{Q⑭}}{c_C}\right)^2 \cdot \Omega_E^⑥$ ⑯ $H_0^2 = \dfrac{8\pi G}{3}\rho_0 + \dfrac{\Lambda c^2}{3}$

(g) $\Lambda = 3 \cdot \left(\dfrac{H_C}{c} \cdot \dfrac{\Omega_E}{\Omega_Q}\right)^2 \cdot \overrightarrow{\Omega_C^\beta}$ ⑰ Forward $\Lambda = 3 \cdot \left(\dfrac{H_C}{c} \cdot \dfrac{\Omega_E}{\Omega_Q}\right)^2 \cdot \dfrac{1}{2\overleftarrow{\Omega_C^\beta}}$ ⑳ Reverse ☞ ⑰x⑳ $\Lambda^2 = 3^2 \cdot \dfrac{H_C^4}{c^4} \cdot \dfrac{\Omega_E^4}{\Omega_Q^4} \cdot \dfrac{\overrightarrow{\Omega_C^\beta}}{2\overleftarrow{\Omega_C^\beta}}$ $1 = 3^2 \cdot \dfrac{t_\Lambda^4}{t_C^4} \overset{②}{\cdot} \dfrac{\Omega_E^4}{\Omega_Q^4} \cdot \dfrac{1}{2}$ $\Omega_E^4 = 2/3^2$, Ω_E = 68.66%, ⑦ Ω_Q = 72.82%

Forward ⑰ $\Lambda = 3 \cdot H_C^2 / c^2 \cdot \Omega_E^2 / \Omega_Q^2 \cdot \overrightarrow{\Omega_C^\beta}$ → $1 = 3 \cdot H_C^2 / c^2 \Lambda \cdot \beta^2/\alpha^2 \cdot \overrightarrow{\Omega_C^\beta} = 3 \cdot t_\Lambda^2 / t_C^2 \cdot \beta^2/\alpha^2 \cdot \overrightarrow{\Omega_C^\beta} = 3 \cdot \beta^2 \cdot \overrightarrow{\Omega_C^\beta}$

forward $1 = 3 \cdot \beta^2 \cdot (1 - \beta + 1/\beta - 1/2\beta^2)$ ⑧ ☞ $\beta^3 - \beta^2 - \beta + 5/6 = 0$ ⑱ ☞ $\overrightarrow{\Omega_E}$ = **68.5548%** $\overrightarrow{\Omega_Q}$ = **72.9343%**

reverse $1 = 3 \cdot \beta^2 \cdot (2\beta - 1 + 1/2\beta^2 - 1/2\beta)$ ⑨ ☞ $12\beta^3 - 6\beta^2 - 3\beta + 1 = 0$ ⑲ ☞ $\overrightarrow{\Omega_E}$ = 68.7331% $\overrightarrow{\Omega_Q}$ = 72.7452%

Reverse ⑳ $\Lambda = 3 \cdot H_C^2 / c^2 \cdot \Omega_E^2 / \Omega_Q^2 / 2\overleftarrow{\Omega_C^\beta}$ → $1 = 3 \cdot H_C^2 / c^2 \Lambda \cdot \beta^2/\alpha^2 / 2\overleftarrow{\Omega_C^\beta} = 3 \cdot t_\Lambda^2/t_C^2 \cdot \beta^2 / \alpha^2 / 2\overleftarrow{\Omega_C^\beta} = 3 \cdot \beta^2 / 2\overleftarrow{\Omega_C^\beta}$ 18 19 21 22 72.82%

forward $1 = 3 \cdot \beta^2 / 2(1 - \beta + 1/\beta - 1/2\beta^2)$ ⑧ ☞ $3\beta^4 + 2\beta^3 - 2\beta^2 - 2\beta + 1 = 0$ ㉑ ☞ $\overleftarrow{\Omega_E}$ = 68.7600% $\overleftarrow{\Omega_Q}$ = 72.7167%

reverse $1 = 3 \cdot \beta^2 / 2(2\beta - 1 + 1/2\beta^2 - 1/2\beta)$ ⑨ ☞ $3\beta^4 - 4\beta^3 + 2\beta^2 + \beta - 1 = 0$ ㉒ ☞ $\overleftarrow{\Omega_E}$ = **68.5869%** $\overleftarrow{\Omega_Q}$ = **72.9002%**

⑲ = ㉑ ☞ $\overleftrightarrow{\Omega_E}$ = 68.7189% $\overleftrightarrow{\Omega_Q}$ = 72.7602% ⑱ = ㉒ ☞ $\overleftrightarrow{\Omega_E}$ = **68.5764%** $\overleftrightarrow{\Omega_Q}$ = **72.9114%**

(h) $\left(1 + \dfrac{3}{8\pi}\right) \cdot \Lambda = 3 \cdot \left(\dfrac{H_C}{c}\right)^2 \cdot \overrightarrow{\Omega_C^\alpha}$ ㉓ Forward ☞ ⑰ $1 + \dfrac{3}{8\pi} = \left(\dfrac{\Omega_Q}{\Omega_E}\right)^2$ $1 + 3/8\pi = 4\Omega_Q^4$, Ω_Q = 72.7324% ⑲㉑ $\left(1 + \dfrac{3}{8\pi}\right) \cdot \Lambda = 3 \cdot \left(\dfrac{H_C}{c_C}\right)^2 \cdot \dfrac{1}{2\overleftarrow{\Omega_C^\alpha}}$ ㉖ Reverse

Forward ㉓ $(1+3/8\pi) \cdot \Lambda = 3 \cdot H_C^2 / c^2 \cdot \overrightarrow{\Omega_C^\alpha}$ → $1 + 3/8\pi = 3 \cdot H_C^2 / c^2 \Lambda \cdot \overrightarrow{\Omega_C^\alpha} = 3 \cdot t_\Lambda^2 / t_C^2 \cdot \overrightarrow{\Omega_C^\alpha} = 3 \cdot \alpha^2 \cdot \overrightarrow{\Omega_C^\alpha}$

forward $1 + 3/8\pi = 3 \cdot \alpha^2 \cdot (1 - \alpha + 1/\alpha - 1/2\alpha^2)$ ④ ☞ $\alpha^3 - \alpha^2 - \alpha + 5/6 + 1/8\pi = 0$ ㉔ ☞ $\overrightarrow{\Omega_Q}$ = **72.9118%** $\overrightarrow{\Omega_E}$ = **68.5760%**

reverse $1 + 3/8\pi = 3 \cdot \alpha^2 \cdot (2\alpha - 1 + 1/2\alpha^2 - 1/2\alpha)$ ⑤ ☞ $12\alpha^3 - 6\alpha^2 - 3\alpha + 1 - 3/4\pi = 0$ ㉕ ☞ $\overrightarrow{\Omega_Q}$ = 72.4243% $\overrightarrow{\Omega_E}$ = 69.0376%

Reverse ㉖ $(1+3/8\pi)\cdot\Lambda = 3\cdot H_C^2/c^2/2\overleftarrow{\Omega}_C^{\alpha} \rightarrow 1+3/8\pi = 3\cdot H_C^2/c^2\Lambda/2\overleftarrow{\Omega}_C^{\alpha} = 3\cdot t_\Lambda^2/t_C^2/2\overleftarrow{\Omega}_C^{\alpha} = 3\cdot\alpha^2/2\overleftarrow{\Omega}_C^{\alpha}$

forward $1+3/8\pi = 3\cdot\alpha^2/2(1-\alpha+1/\alpha-1/2\alpha^2)$ ④ ☞ $3\alpha^4+(1+3/8\pi)\cdot(2\alpha^3-2\alpha^2-2\alpha+1)=0$ ㉗ ☞ $\overleftarrow{\Omega}_Q = 72.4415\%$ $\overleftarrow{\Omega}_E = 69.0212\%$

reverse $1+3/8\pi = 3\cdot\alpha^2/2(2\alpha-1+1/2\alpha^2-1/2\alpha)$ ⑤ ☞ $3\alpha^4-(1+3/8\pi)\cdot(4\alpha^3-2\alpha^2-\alpha+1)=0$ ㉘ ☞ $\overleftarrow{\Omega}_Q = 72.9510\%$ $\overleftarrow{\Omega}_E = 68.5391\%$

(i) ⑰ $(1+f\cdot\Omega_R)\cdot\Lambda = 3\cdot H_C^2/c^2\cdot\Omega_E^2/\Omega_Q^2\cdot\overrightarrow{\Omega}_C^{\beta}$ ㉙ ☞ ⑱ $\beta^3-\beta^2-\beta+5/6+f\cdot\Omega_R/3=0$ ⑦ $\beta = 1/2\alpha$ Assume

⑳ $(1-(1-f)\cdot\Omega_R)\cdot\Lambda = 3\cdot H_C^2/c^2\cdot\Omega_E^2/\Omega_Q^2/2\overleftarrow{\Omega}_C^{\beta}$ ㉚ ☞ ㉒ $3\beta^4/(1-(1-f)\Omega_R)-4\beta^3+2\beta^2+\beta-1=0$ ㉜ $g = f$

㉓ $(1+3/8\pi+g\cdot\Omega_r)\cdot\Lambda = 3\cdot H_C^2/c^2\cdot\overrightarrow{\Omega}_C^{\alpha}$ ㉛ ☞ ㉔ $\alpha^3-\alpha^2-\alpha+5/6+1/8\pi+g\cdot\Omega_r/3=0$ Error ㉝ $\Omega_r/\Omega_R = 3/8\pi\cdot H_Q^2\Omega_E/H_E^2\Omega_Q$

☞ **Ω_Q = 72.9138% Ω_E = 68.5741%** **f = 0.59322 g = 0.59322 Ω_R = 9.3477E-4 Ω_r = 9.117E-5** **Ω_γ = 5.408E-5 Ω_v = 3.708E-5**

72.9161% 0.003% 9.24, 9.03, ... 5.46, 5.38, ... 3.78, 3.65, ...

③ $1/\Omega_Q - 1 =$ **ω_Q = 37.1482%** $2-1/\Omega_Q =$ **ω_E = 62.8518%** $\Omega_Q\cdot\omega_Q+\Omega_E\cdot\omega_E =$ **Ω_C = 70.1862%** $\Omega_v/\Omega_\gamma = 68.5721\%$

㉞ $(t_\Lambda\cdot\Omega_\gamma/2\Omega_C$ 387.2E3Y + $t_\Lambda\cdot\Omega_\gamma\cdot\Omega_E$ **372.7E3Y**$)/2 =$ 380.0E3Y $1-\Omega_Q/\Psi_Q = 0.0031\%$ ㊲

Δ=117.1E3Y

㉟ $(t_\Lambda\cdot\Omega_v/2\Omega_C$ 265.5E3Y + $t_\Lambda\cdot\Omega_v\cdot\Omega_E$ **255.6E3Y**$)/2 =$ 260.5E3Y $(1-\Omega_Q/\Psi_Q)\cdot\Omega_R/\Omega_r = 0.0317\%$ ㊳

72.913849% 70.186233% 72.916108% 0.00001%

㊱ $\Omega_Q/(1-(\Omega_\gamma\cdot\omega_Q+\Omega_v\cdot\omega_E)/2\Omega_C) = \Psi_Q =$ **72.916103%** **Dark Force Ratio [γv]** $(1-\Omega_Q/\Psi_Q)\cdot\Omega_R/\Omega_r\cdot\Omega_Q = 0.0231\%$ ㊴

㊵ $\omega_Q/\omega_E = 0.59104(?)$ ㊶ $1/(1+\Omega_E) = 0.59321(?)$ ☞ When applied to either f or g, the difference is almost zero%

(j) **Hubble Tension** ⑯ $c^2\Lambda = 1/t_\Lambda^2 = 1/t_C^2/\Omega_Q^2 = H_C^2/\Omega_Q^2 = 3H_Q^2/2\Omega_Q$ ☞ $H_{cmb}^Q/H_{uni}^C = \sqrt{\tfrac{4}{3}\Omega_E} = 0.956201$ ㊷

③ $H_{cmb}^Q\cdot\omega_Q + H_{red}^E\cdot\omega_E = H_{uni}^C$ ☞ $H_{red}^E/H_{uni}^C = 1.025887$ ㊸ $(H_{red}^E/H_{uni}^C)^2 = 1.052444$ ㊹ ☞ $H_{red}^E/H_{cmb}^Q = 1.072877$ ㊺

Ref[2] Fig1(b,d) $\log l_{P1}^E$ 1.18187E4 / $\log l_{P1}^Q$ 7.40315E3 = 1.05250(?) ㊻ 0.006%

Ref[1] Fig22

㊼ $\dfrac{r_p^Q}{r_p^E} = \dfrac{0.875060\text{ fm}^{0.8751}}{0.841005\text{ fm}^{0.8409}} = 1.040493$ 0.0032% ㊲ $\dfrac{H_{red}^E}{H_{cmb}^Q}\cdot\left(\dfrac{\Omega_E}{\Omega_Q}\right)^{1/2} = 1.040459 \equiv \left(\dfrac{l_{P0}^Q}{l_{P0}^E}\right)^2$ ㊽ ㊾ ㊻ ☞ $l_{P0}^Q = 1.648627\text{E-}35\text{m}$

$l_{P0}^C = l_{P0}^Q\cdot\omega_Q + l_{P0}^E\cdot\omega_E = 1.628281\text{E-}35\text{m}$

㊿ $\dfrac{r_p^Q}{r_p^E}\cdot\dfrac{\tau_n^Q}{\tau_n^E} = 1.040459\cdot\dfrac{887.7\text{s beam}}{877.75\text{s bottle}} = 1.05225$ 0.018% ㊹

0.0002%

(51) $l_{P3}^Q/l_{P2}^Q\cdot(1-f\cdot\Omega_R/\omega_Q)\cdot H_{uni}^{C2}/H_{cmb}^{Q2}$ = 2.745157E8 Ref[2] Fig1(b) · (1 - 0.59322·9.3477E-4 / 37.1482%) / 0.956201^2 = 2.997918E8

(52) $l_{P3}^E/l_{P2}^E\cdot ?$ 3.053522E8 Ref[2] Fig1(d)

(k) **Ratio = Constant vs Growth = Parameter**

Ref[2] Table1(4) 0.001% Ref[2] Table1(5) 0.032% ㊳ Ref[2] Fig5 0.023% ㊴

(53) $l_{P3/P2}^C\cdot l_{P0}^{Q/E} = 2.99789\text{E8 m/m}$ (54) $l_{P6/P3}^C\cdot l_{P0}^{C/Q}\cdot 3/8\pi = 2.99887\text{E8}$ (55) $\hbar_2 = m_{g2}^E\cdot c\cdot l_{P3}^E\cdot l_{P0}^{K/S}\cdot\sqrt{l_{P0}^{K/C}} = 6.5836\text{E-}16$

Ratio Constant Ratio Constant Growth Parameter Growth Parameter

(56) $c_C = 2.9979246\text{E8}$ $\hbar_E = 1.0545718\text{E-}34$ $G_? = 6.67430\text{E-}11$ ☞ $l_{P0}^E = \sqrt{\hbar_E\cdot G_?/c_C^3} = 1.616255\text{E-}35\text{m}$

(l) **Hubble Constant** (57) **$l_{P0}^{C2}\cdot\Lambda_3^C$ = 1E-121.53272** = ㊾ $1.628281\text{E-}35^2\cdot\Lambda$ ☞ **Λ = 1.106169E-52 /m2** 1.1056

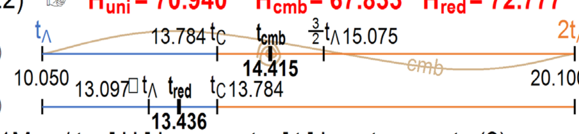
Ref[1] 3.18 13.787

① $1/c\sqrt{\Lambda} =$ **t_Λ = 10.050 BY** ② $\Omega_Q = 72.9138\% = t_\Lambda/t_C$ ☞ **t_C = 13.784 BY**

13.784 BY ㊷ 14.415 BY ㊸ 13.436 BY

$H_{uni}^C = 1/t_C = 3.08568\text{E19}/(13.784\text{E9}\cdot 60\cdot 60\cdot 24\cdot 365.2422)$ ☞ **H_{uni}^C = 70.940** **H_{cmb}^Q = 67.833** **H_{red}^E = 72.777**

$\dfrac{t_C}{2t_\Lambda} \overset{⑥}{=} \Omega_E \overset{⑯}{=} \dfrac{\Lambda c^2}{3H_{cmb}^2} \overset{①}{=} \dfrac{t_{cmb}^2}{3t_\Lambda^2}$ Universe event horizon ☞ Superposition $t_{cmb} = \sqrt{t_C\cdot\tfrac{3}{2}t_\Lambda} = 14.415\text{BY}$ (58) H 67.833 Reversible & Optimized Ref[3] 2.6



(58) $t_{red} = \sqrt{t_C\cdot\square t_\Lambda} = 13.436\text{BY}$ ☞ $\square = 1.30314(?)$ (59) H 72.777

※ t_{cmb} is on the right side and t_{red} is on the left side ☞ H = 1Mpc / t : [H] is property, [t] is not property (?)

(m) **Mystery of Big G** 6.67428(2006) 6.67384(2010) 6.67408(2014) 6.67430(2018) **6.67430E-11(2022) = G_v**

G_γ $G_{\gamma v}^1$ G_v $G_{\gamma v}^1 = G_v\cdot(1-½\Omega_r/2\Omega_C) = 6.67408\text{E-}11$ G_γ $G_{\gamma v}^2$ G_v $G_{\gamma v}^2 = G_v\cdot(1-\Omega_v/2\Omega_C) = 6.67412\text{E-}11$

1/2 1/2 $G_\gamma = G_{\gamma v}^1(1-½\Omega_r/2\Omega_C) = 6.67387\text{E-}11$ $\Omega_\gamma/2\Omega_C$ $\Omega_v/2\Omega_C$ $G_\gamma = G_{\gamma v}^2\cdot(1-\Omega_v/2\Omega_C) = 6.67387\text{E-}11$

G_γ ω_Q $G_{\gamma v}^3$ ω_E G_v $G_{\gamma v}^3 = G_v\cdot(1-(\Omega_\gamma\cdot\omega_E+\Omega_v\cdot\omega_Q)/2\Omega_C) =$ **6.67407E-11** (60) reverse $1-G_{\gamma v}/G_v = 0.0034\%$ $1-G_\gamma/G_{\gamma v} = 0.0031\%$

$\Omega_\gamma/2\Omega_C$ $\Omega_v/2\Omega_C$ $G_\gamma = G_{\gamma v}^3(1-(\Omega_\gamma\cdot\omega_Q+\Omega_v\cdot\omega_E)/2\Omega_C) =$ **6.67387E-11** (61) forward $1-G_\gamma/G_v = 0.0065\%$ (62)

$\alpha_G = G_{\gamma v}\cdot m_P^2/c/\hbar = 6.67407\text{E-}11\cdot 1.67262\text{E-}27^2/2.99792\text{E8}/1.05457\text{E-}34 =$ **5.90595E-39** (63)

If $G_v = 6.67428\text{E-}11$, then $G_{\gamma v} = 6.67405\text{E-}11$, $G_\gamma = 6.67385\text{E-}11$, $\alpha_G = 5.90593\text{E-}39$

0.01%

$\Psi_Q/(1-\Psi_Q) = 2.69223$ ☞ $l_{P0/P1}^C$ 1.62829E-35/1.01786E4·(2.69223+1) = 5.90653E-39 (64)

Ref[2] Table1(10) 0.0000%

$\Omega_Q/(1-\Omega_Q) = 2.69192$ ☞ $l_{P0/P1}^C$ 1.62829E-35/1.01786E4·(2.69192+1)$\cdot\sqrt{\Omega_Q/\Psi_Q}$ = 5.90595E-39 (65)

(66) If $G_\gamma = 6.67430\text{E-}11(2022)$ ☞ $G_{\gamma v}^1 = 6.67408\text{E-}11$, $G_{\gamma v}^2 = 6.67404\text{E-}11$, $G_{\gamma v}^3 = 6.67409\text{E-}11$ ☞ $G_v = 6.67387\text{E-}11$

(n) **Theory of Everything = Drawing of Everything + Calculation of Everything**

5.90615 ~ 5.90575E-39 Z 91.1876 GeV(±0.0023%)

Six Variables: e 510.998950 keV, μ 105.658375 MeV, p 938.272089 MeV, α 1/137.035999, αG 5.9059_E-39, Ω 72.916103%

Fig. 1 Calculation of Everything – The universe

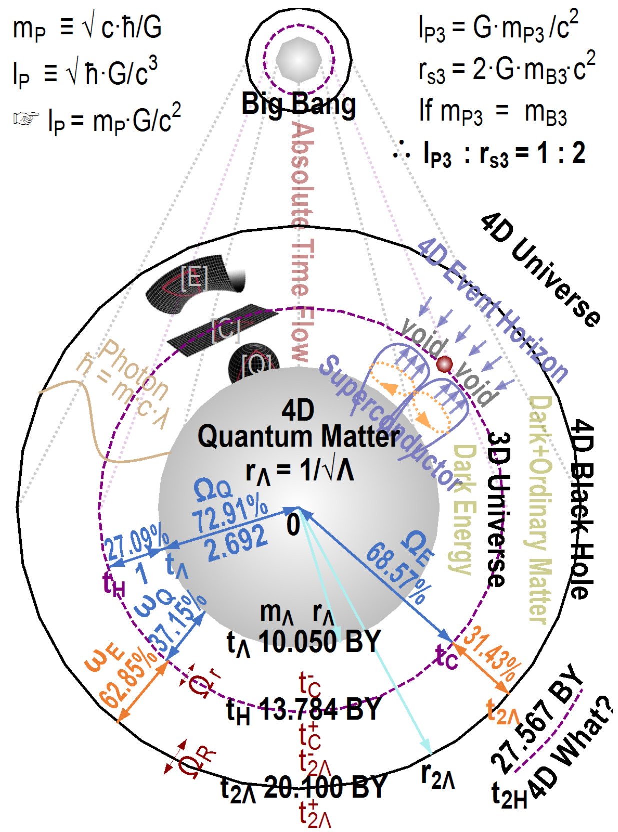


Fig. 2 Shape of Quantum Hole

3.3 Radius of quantum matter: 10.053E9 LY

From ①, the l_{P3} of our universe is $1/\sqrt{\Lambda}$, and the cosmological constant Λ represents the radius of quantum matter in Fig. 2. Since the cosmological constant Λ is known to be 1.1056E-52 /m2, the radius of 4D quantum matter t_Λ is calculated as 10.053E9 LY. Therefore, the radius of 4D event horizon $t_{2\Lambda}$ is twice 20.106E9 LY. This value is drawn in Fig. 1(c). Here, zero is Big Bang and t_C is age of the universe.

3.4 Dark time ratio Ω_Q: 72.915%

In the integration of four fundamental forces of Table 2 in Ref. [1], dark energy ratio was calculated as 72.916%. In Fig. 1(c), the left side of t_C is the force (⇒) pushed by superconductor, and the right side of t_C is the force (⇐) pushed by event horizon. Therefore, the characteristics of above two are different. The quantum state of left side is inside, past, and CMB, and the event state of right side is outside, future, and redshift. Let's define ② $\alpha \equiv \Omega_Q = t_\Lambda/t_C$. Since the age of universe t_C is known to be 13.787 BY, the dark energy ratio Ω_Q is 72.915% (= 10.053 / 13.787), the quantum state ratio $\omega_Q^\alpha = 1/\alpha - 1$ is 37.14% (= 3.734 / 10.053), and the event state ratio $\omega_E^\alpha = 2 - 1/\alpha$ is 62.86% (= 6.319 / 10.053).

3.5 Combined universe: C = Q·ωQ + E·ωE

On the 3D universe t_C of Fig. 2, looking inside, there is a spherical quantum matter. Let's call it [Q]uantum state. Looking outside, there is a saddle-shaped event horizon. Let's call it [E]vent state. In previous study [1], [Q] was called Kinetic state and [E] was called Steady state. The universe consists of the mixture of [Q] and [E], which makes it appear flat universe. Let's call it the [C]ombined state. The combined state is defined as ③. To explain it easily, the present [C] is made up of a mixture of ω_Q% of past [Q] and ω_E% of future [E].

3.6 Constant velocity expansion: 71.0 km/s/Mpc

If universe is expanding at a constant velocity, Hubble constant is 70.92 km/s/Mpc. In Fig. 1(c), the sum of the 37.14% of CMB 67.66 km/s/Mpc and the 62.86% of Redshift ≈73 km/s/Mpc is 71.0 km/s/Mpc. Therefore, it is understood that universe is expanding at constant velocity.

3.7 Combined dark time ratio Ω_C^α

The combined dark time ratio is expressed as ④ $\vec{\Omega}_C^\alpha$ and ⑤ $\overleftarrow{\Omega}_C^\alpha$, which are in the 'forward' direction calculated from left to right and 'reverse' direction calculated from right to left. These values are calculated as 70.19% and 71.30%. What does the formula mean? It's hard to understand.

3.8 Dark time ratio Ω_E: 68.572%

In Fig. 1(d), twice t_Λ is $2t_\Lambda$, which is the event horizon. Double t_C is $2t_C$ and let's call it 'What'. The left side of $2t_\Lambda$ is 4D black hole and the right side is 4D universe. Let's define ⑥ $\beta \equiv \Omega_E = t_C/2t_\Lambda$. From the same logic, the dark time ratio Ω_E is 68.572% (= 13.787 / 20.106), the [Q]uantum state ratio $\omega_Q^\beta = 1/\beta - 1$ is 45.83% (= 6.319 / 13.787), and the [E]vent state ratio $\omega_E^\beta = 2 - 1/\beta$ is 54.17%% (= 7.468 / 13.787). It is very important that Ω_Q is based on the t_C of our universe, and Ω_E is based on the $2t_\Lambda$ of event horizon.

3.9 Constant velocity expansion: 71.0 km/s/Mpc

From the same logic, the combined Hubble constant is calculated as 70.4 km/s/Mpc. This is judged to be incorrect.

3.10 Dark time ratio: Ω_Q x Ω_E = 1 / 2

The product of ② Ω_Q and ⑥ Ω_E is always ⑦ 1 / 2. Let's remember this formula always. Before Planck value is 72.8%, Planck 2018 value is 68.57%, and the product of above two is 1 / 2.003. It is understood that both Before Planck and After Planck are correct. Proton radius in hydrogen is 0.8751 fm and muon is 0.8409 fm, neutron lifetime in beam is 887.7s and in bottle is 877.75s, and Hubble constant of 67.66 km/s/Mpc of CMB and about 73 km/s/Mpc of redshift are all correct.

3.11 Combined dark time ratio Ω_C^β

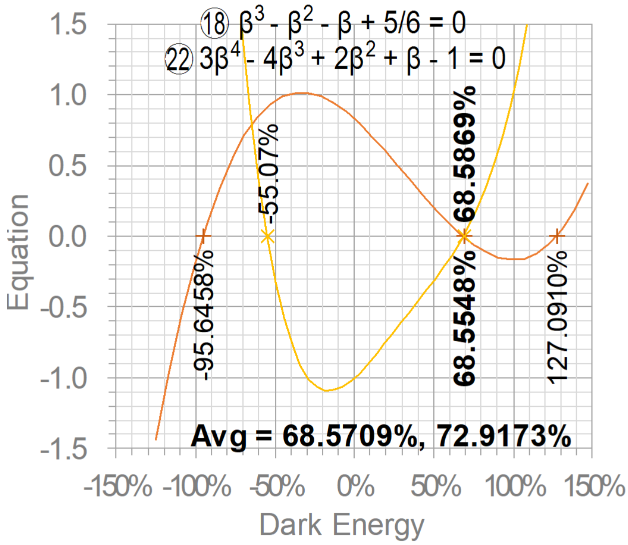


Fig. 3 Function of ⑱ & ㉒

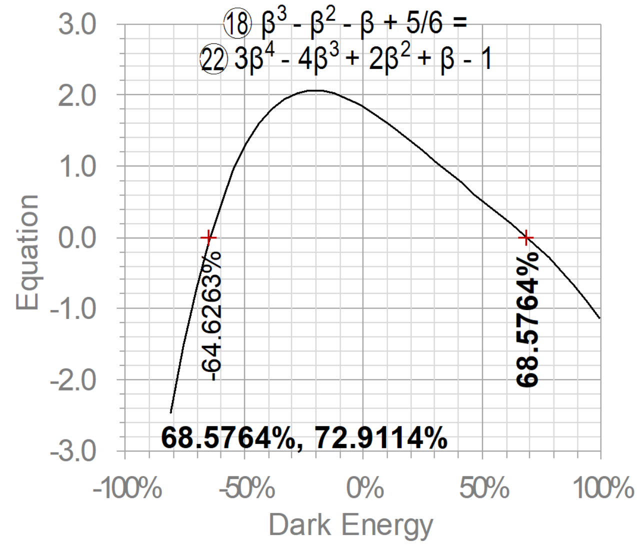


Fig. 4 Function of ⑱ = ㉒

The combined dark time ratio is expressed as ⑧ $\vec{\Omega}_C^{\beta}$ and ⑨ $\overleftarrow{\Omega}_C^{\beta}$, which are in the 'forward' direction calculated from left to right and 'reverse' direction calculated from right to left. These values are calculated as 70.93% and 70.56%. What does the formula mean? It's hard to understand.

4. Dark Matter

4.1 Mass of anti-matter = 2 x mass of matter

In the figure of Fig. 1(e), the blue and the red are Planck Star, and the blue means anti-matter [S] and the red means matter [N]. In Ref. [1], section 8.2, etc., it was calculated that [S] is 2π times heavier than [N].

4.2 Mass of Planck Star

Let's understand that the Planck mass formula calculates 0D. Applying 3D and [S], the mass m_Λ of the blue is calculated as ⑩. Schwarzschild radius r_s is $2r_P$. The mass of black hole m_P expressed in terms of r_P is ⑪.

4.3 Planck 2018 results

In Planck 2018 results, the ratio of dark energy : dark matter : ordinary matter was presented as 68.89% : 26.19% : 4.92%. On Wikipedia's "observable universe" webpage, the mass of ordinary matter in the universe is given as about 1.5_E53 kg. Therefore, the mass of dark matter is about 8.0_E53 kg.

4.4 Mass of dark matter

From ⑩ and ①, the mass of dark matter m_Λ is calculated as 8.04E53 kg. This is exactly equal to 8.0_E53 kg.

5. Dark Energy

5.1 3D Density of 4D Q.H.

In Fig. 1(f), the radius of quantum hole is $2r_\Lambda$, and since the 4D surface area is the 3D volume, the 3D volume of the 4D Q.H. is ⑫. Therefore, the 3D density of 4D Q.H. is calculated as ⑬ from ⑩ and ⑫.

5.2 3D Density of 3D B.H.

From Schwarzschild radius formula, the 3D density of 3D B.H. is calculated as ⑭.

5.3 Relationship of Λ, H, Ω

Therefore, from the definition of dark energy ratio, Ω_Λ is derived and rearranged to ⑮. Here, Λ means r_Λ, H_s means the event horizon of black hole, and Ω_Λ means $2r_\Lambda$. Everything should be separated into [Q] [E] [C]. In Fig. 1(b), the cosmological constant problem is solved from the neutrino mass in [C] state. Therefore, l_{P3} and Λ are in [C] state. The speed of light c 2.99792E8 m/s from Table 1(4) of Ref [2] is calculated as in [C] state. Therefore, ⑯ is rearranged from ①, ⑭, and ⑥.

5.4 Before Planck: 72.8%

The ⑰ is proposed to calculate [C], and this is in the 'Forward' direction formula. From the idea of ⑦, the ⑳ will be established, which is the 'Reverse' direction formula. When ⑰ and ⑳ are multiplied, Ω_Q is calculated as 72.82%. The value of Before Planck is 72.8%.

5.5 Dark energy ratio: 72.9343%

After rearranging ⑰ of 'Forward', and substituting ⑧ of 'forward', the ⑱ is arranged. From Fig. 3, the value of $\vec{\Omega}_{\vec{E}}$ is

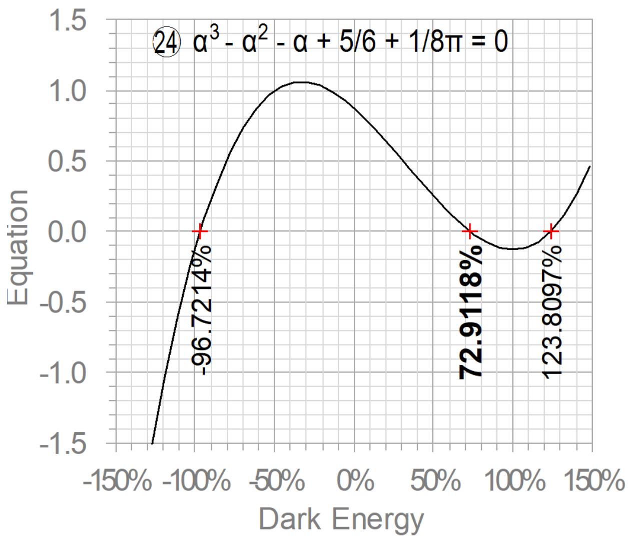


Fig. 5 Function of ㉔

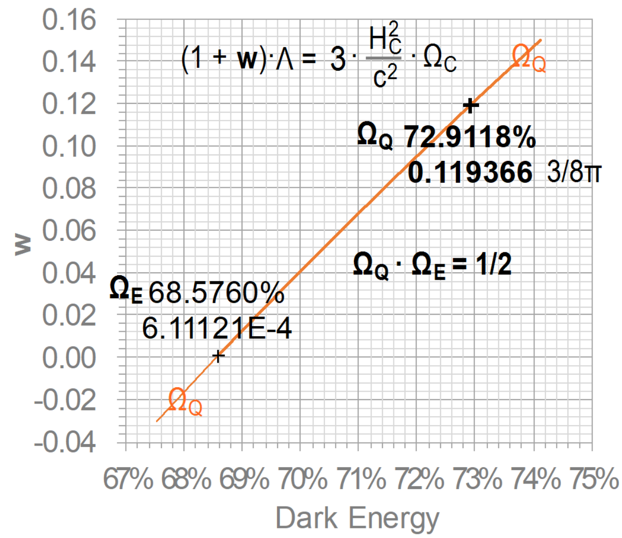


Fig. 6 Calculation according to change of [w]

calculated as 68.5548%, and from ⑦, the value of $\vec{\Omega}_{\bar{Q}}$ is calculated as 72.9343%. Substituting ⑨ of 'reverse', it is arranged to ⑲, and $\vec{\Omega}_{\tilde{E}}$ and $\vec{\Omega}_{\tilde{Q}}$ are calculated as 68.7331% and 72.7452%.

5.6 Dark energy constant & Cosmological parameter

In ①, t_Λ is $1/c\sqrt{\Lambda}$. If Λ is a constant, t_Λ is also a constant. In ②, $\Omega_{\rm Q}$ is $t_\Lambda/t_{\rm C}$. Since $t_{\rm C}$ is time flow and t_Λ is a constant, $\Omega_{\rm Q}$ becomes parameter. The formula developed above is a general-purpose formula according to time flow, but Ω was calculated as a constant. This means that dark energy ratio Ω is a constant regardless of time flow and cosmological constant Λ is parameter such as Hubble constant.

5.7 Dark energy ratio: 72.9002%

After rearranging ⑳ of 'Reverse' and substituting ⑧ of 'forward', the ㉑ is derived, and 68.7600% and 72.7167% are calculated. Substituting ⑨ of 'reverse', the ㉒ is arranged, and from Fig. 3, 68.5869% and 72.9002% are calculated.

5.8 Which is correct answer?

The average of ⑱⑲㉑㉒ is calculated as 72.82%, and Before Planck value is 72.8%. As shown in Fig. 3, the simple average of ⑱㉒ is 72.9173%. If ⑱ and ㉒ are the same, from Fig. 4, the 68.5764% and 72.9114% are calculated. In Fig. 16(b) of Ref. [1], the 72.916% was calculated from the integration of four fundamental forces.

5.9 Dark energy ratio: 72.9118%

As shown in Fig. 1(h), The ㉓ is proposed. When solving by substituting ⑰, $\Omega_{\rm Q}$ is calculated as 72.7324%, which is similar to ⑲㉑. This formula is very clean, so 72.7323% appears to be the correct answer. However, ⑲ is 'Forward & reverse', and ㉑ is 'Reverse& forward', which have different logic and direction. Also, 72.916% was calculated in a previous study. Therefore, it is wrong answer.

By expanding ㉓ of 'Forward' and substituting ④ of 'forward', ㉔ is arranged, and 72.9118% is calculated from Fig. 5. Substituting ⑤ of 'reverse', ㉕ is arranged, and 72.4243% is calculated. ㉖ is 'Reverse' formula, and by substituting ④ and ⑤, 72.4415% and 72.9510% are calculated.

As shown in Fig. 6, the result according to the change of [w] is shown. At 6.11121E-4 and 3/8π, $\Omega_{\rm Q} \cdot \Omega_{\rm E}$ becomes 1/2. Therefore, it can be understood that 1 + 3/8π is a conversion factor that changes $\Omega_{\rm E}$ to $\Omega_{\rm Q}$.

5.10 Time gap ratio: Ω_r, Ω_R

The 6.11121E-4 in Fig. 6 is judged to mean the difference between ⑰, ⑳, and ㉓. In Fig. 1, the time of universe flows from Big Bang to $t_{\rm C}$ 13.784 BY. In that 4D space direction, there is $\Omega_{\rm r}$ of inside t_C^- and outside t_C^+. Also, there is $\Omega_{\rm R}$ of inside $t_{2\Lambda}^-$ and outside $t_{2\Lambda}^+$. Fig. 7 shows this in detail. The time of event horizon is $t_{2\Lambda}$ 20.100E9Y. The β^- 68.5548% of ⑱ means the inside time $t_{2\Lambda}^-$, and the β^+ 68.5869% of ㉒ means the outside time $t_{2\Lambda}^+$. Also, the time of our universe is t_C 13.784E9Y, and the α^- 72.9118% of ㉔ means the inside time t_C^-. Here, it should be noted that Fig. 7 is not the exact illustration.

5.11 Dark energy ratio: 72.9138%

As shown in Fig. 1(i), ㉙ is ⑰ plus $f \cdot \Omega_{\rm R}$, which moves the value of ⑱ in Fig. 7 to the right. ㉚ is ⑳ minus $(1 - f) \cdot \Omega_{\rm R}$, which moves the value of ㉒ in Fig. 7 to the left. ㉛ is ㉔ plus $g \cdot \Omega_{\rm r}$, which moves the value of ㉔ in Fig. 7 to the right. The rearranged equations are similar to ⑱, ㉒, and ㉔. β is $1/2\alpha$ from ⑦. Let's assume g is equal to f in ㉜, and $\Omega_{\rm r}$ is calculated from $\Omega_{\rm R}$ in Eq. ㉝. Here, $\rm H_Q/H_E$

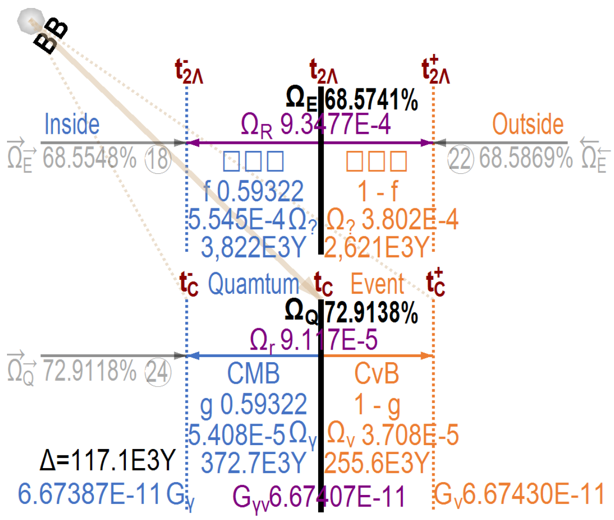


Fig. 7 Radiation density of CMB & CνB

is calculated from ㊺. There are six equations and six unknowns. Calculating the above formulas, the values of $\Omega_{\rm Q}$, $\Omega_{\rm E}$, and $\Omega_{\rm C}$ are calculated as 72.9138%, 68.5741%, and 70.1862%.

5.12 Radiation ratio: 9.117E-5 = 5.408E-5 + 3.708E-5

In Fig. 1, Big Bang's CMB is located on t_C^-, and Big Bang's CνB is located on t_C^+. The value of $\Omega_{\rm r}$ was calculated as 9.117E-5. Therefore, 5.408E-5 is the Ω_γ of CMB, and 3.708E-5 is the Ω_ν of CνB. From ㉝, 387.2E3Y and 372.7E3Y are calculated, and their average is 380.0E3Y. The latter may be the correct answer. From ㉞, 265.5E3Y and 255.6E3Y are calculated, and their average is 260.5E3Y. The latter may be the correct answer.

5.13 Dark force ratio: 72.916013%

In Fig. 16 of Ref. [1], the dark force ratio of 72.916% (more precisely 72.916108%) was calculated from the integration of four fundamental forces. In ㊱, the numerator is the dark energy ratio $\Omega_{\rm Q}$, and the denominator contains the effects of CMB and CνB. The value $\Psi_{\rm Q}$ is 72.916103%, and the difference is 0.00001%. It can be confirmed that this calculation is accurate answer.

5.14 Very small errors

The difference between $\Omega_{\rm Q}$ and $\Psi_{\rm Q}$ is ㊲ 0.0031%. If there is an error of 0.0031% in any calculation, this value is the cause. The values of ㊳ and ㊴ are 0.0317% and 0.0231%. It is not yet clear what these formulas mean.

5.15 Which is the correct formula?

In ㉜, g was equal to f, and the value was calculated as 0.59322. The value is 0.59104 in ㊵, and the value is 0.59321 in ㊶. Why are the values similar or almost the same? When this formula was applied to either f or g, the difference is almost zero%. Which is the correct formula?

6. Hubble Tension

6.1 Hubble parameter ratio: 1.072877

As shown in Fig. 1(j), expanding ⑯, H_{cmb}^{Q} / H_{uni}^{C} is derived into ㊷ $\sqrt{4/3 \cdot \Omega_{\rm E}}$, and the value is calculated as 0.956201. From ③, H_{red}^{E} / H_{uni}^{C} is calculated as ㊸ 1.025887, and the square is ㊹ 1.052444. Therefore, the value of H_{red}^{E} / H_{cmb}^{Q} is ㊺ 1.072877.

6.2 Verification of results

When calculating ㊻ from Table1(5) in Ref. [2], it is calculated as 1.05250, which is 0.006% difference from ㊹. However, this is thought to be a coincidence.

In Fig. 12 of Ref. [1], the proton radius in hydrogen was calculated as r_p^Q 0.875060 fm (physics 0.8751), the proton radius in muon was calculated as r_p^E 0.841005 fm (physics 0.8409), and the ratio is ㊼ 1.040493. The difference of ㊽ is 0.0032%, and the value of ㊲ is 0.0031%. Coupled with the lifetime time of neutrons in beam and bottle, the value is ㊿ 1.05225, and the difference of ㊹ is 0.018%. The error of (51) is 0.0002% of the speed of light. The formula of (52) has not yet been discovered. It is thought to not exist.

6.3 Ratio = Constant vs Growth = Parameter

In Fig. 1, (a)~(d) were examples to help understand the calculation. In the expanded formulas of (e)~(j), there were no input constants. That is, all calculated values are ratios, and those ratios are constants. That is, we can understand that all ratios are all constants. In Fig. 1, the r_Λ is the growth of quantum matter. Therefore, we can understand that related to r_Λ is a parameter that grows over time.

In Table 1(4) of Ref. [2], (53) was calculated, which is a difference of 0.001% of the speed of light. In Table 1(5) of Ref. [2], (54) was calculated, which is a difference of 0.032% of the speed of light. See ㊳. In Fig. 5 of Ref. [2], (55) was calculated, which is a difference of 0.023% of Dirac constant. See ㊴. Therefore, in (56), light speed c and Dirac constant $\hbar$ are ratio constant found from formulas. Since Planck's constant $l_{\rm P}$ is a growth parameter, it is understood that the gravitational constant G is a growth parameter. Everything should be divided into [Q] [E] [C]. However, G is judged to apply to everything without distinction.

6.4 Cosmological constant problem

Gravitational constant G is given in physics as 6.67430E-11 m^3/kg^{1}s^2. From (56), l_{P0}^{E} is calculated as 1.616255E-35 m. ㊾ is proposed. From this formula, l_{P0}^{Q} is calculated as 1.648627E-35 m, and its combined Planck length l_{P0}^{C} is calculated as 1.628281E-35 m. In section 3.18 of Ref. [1], the

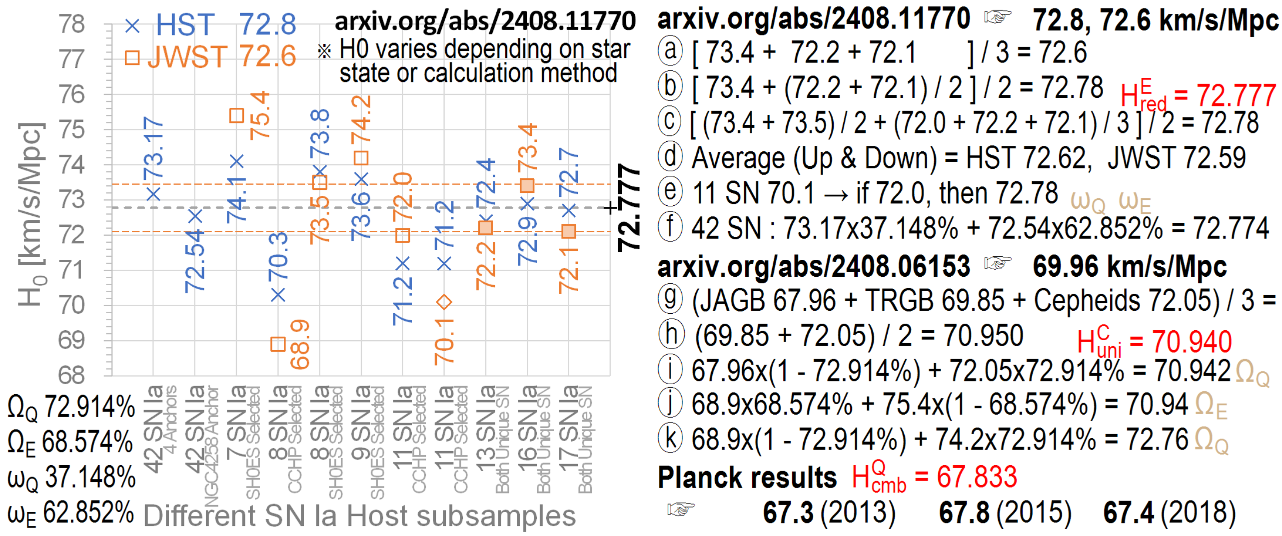


Fig. 8 Hubble constant values reinterpreted from JWST results

value of $l_{P0}^{C2} \cdot \Lambda_3^C$ was calculated as 1E-121.53272. Therefore, from ⑰, the cosmological constant Λ is calculated as 1.106169E-52 /m^2. Therefore, from ①, t_Λ is calculated as 10.050 BY, and the age of the universe t_C is calculated as 13.784 BY.

6.5 Hubble constant

From these values, H_{uni}^C is calculated as 70.940, H_{rcmb}^Q is 67.833 and H_{red}^E is 72.777 km/s/Mpc.

6.6 Position of CMB

㊽ t_{cmb} from ⑥⑯① is calculated as 14.415BY. The formula is illustrated in the figure. The $1.5t_\Lambda$ is the middle of t_Λ and $2t_\Lambda$. The t_C is the current time of the universe. The square root of the product of those two is the time at which CMB is located. The t_{cmb} means the event horizon of universe black hole. The equation on the right means that the quantum space of t_C and the quantum space of $1.5t_\Lambda$ are in a reversible and optimal superposition, as described in Section 2.6 of Ref. [3].

6.7 Position of Redshift

㊽ is the formula for CMB. A formula for Redshift with a similar form to ㊽ has not yet been found. It is thought that the formula does not exist. Since 68 to 78 km/s/Mpc are all correct, the formula for redshift probably does not exist. From the formula form of ㊽, □ is calculated as 1.30314.

6.8 Wrong location?

In the drawing of Fig. 1(c), CMB is located on the left side of t_C, and Redshift is located on the right side of t_C. However, in (l), the positions are reversed. This may be because H is 1Mpc / t, and Hubble constant is a physical property, while absolute time is not a physical property.

6.9 HST 72.8, JWST 72.6 km/s/Mpc

The Hubble constant values from HST (Hubble Space Telescope) and JWST (James Webb Space Telescope) are plotted in Fig. 8. In that study, three representative values were selected such as ⓐ, and 72.8 km/s/Mpc was presented at HST and 72.6 km/s/Mpc at JWST. These values can be said to be the same as H_{red}^E 72.777 km/s/Mpc.

6.10 H = (Avg H_{UP} + Avg H_{DOWN}) / 2 = 72.78 km/s/Mpc

The average of 72.2, 73.4, and 72.1 km/s/Mpc is slightly biased toward 72 km/s/Mpc. In Fig. 8, based on 72.777 km/s/Mpc, the average of up numbers and the average of down numbers are calculated, and the average of those two averages will be more reasonable. Therefore, ⓑ is calculated as 72.78 km/s/Mpc, and ⓒ is also calculated as 72.78 km/s/Mpc. The average for all values in Fig. 8 is HST 72.62 and JWST 72.59, as in ⓓ. However, at 11 SN Ia, HST is 71.2 and 71.2, but JWST is 72.0 and 70.1. The 70.1 of JWST is judged to be an incorrect value. If this value is the same 72.0, then the overall average of JWST is calculated as 72.78 km/s/Mpc of ⓔ.

6.11 Quantum state 37.148%, Event state 62.852%

The values of 42 SN Ia are given as 73.17 and 72.54 of 4 significant digits. This probably means that it is accurate. ⓐ~ⓔ were the calculation of average value. However, ⓕ is also calculated as 72.774 km/s/Mpc. What is the reason? If there is only one correct answer for Hubble constant, the calculation of ⓕ will be a coincidence value. However, if there are multiple correct answers for Hubble constant depending on the state of star or the methodology of calculation, the calculation of ⓕ will be correct. If the latter is true, most of the measured Hubble constant values may be correct.

6.12 JAGB 67.96, TRGB 69.85, Cepheids 72.05

In ⓖ, the representative values for JAGB, TRBG, and Cepheids measured from JWST are presented as 67.96, 69.85, and 72.05 km/s/Mpc. In the paper, 69.96 km/s/Mpc is presented as the combined value. The value of H^{C}_{uni} was calculated as 70.940 km/s/Mpc. As in ⓗ, the average of 69.85 and 72.05 is calculated as 70.950 km/s/Mpc. Also, ⓘ is calculated as 70.942 km/s/Mpc. The 75.4 of 7 SN la is too large, and the 68.9 of 8 SN la is too small, which seems to be an error. However, the value of ⓙ is 70.94 km/s/Mpc. Also, the value of ⓚ is 72.76 km/s/Mpc. Is this calculation correct or just a coincidence?

6.13 Huble constant of Planck results

The abstract of Planck results document shows 67.3 km/s/Mpc in 2013, 67.8 km/s/Mpc in 2015, and 67.4 km/s/Mpc in 2018. The value of H^{Q}_{cmb} was 67.833 km/s/Mpc.

7. Mystery of Big G

7.1 Gravitational Constant G: 6.67430E-11

Mystery of Big G is that the measurement of gravitational constant is very difficult. In all the calculations of Fig. 1, only G 6.67430E-11 was input as a constant. Therefore, it can be understood that the precision of the G value is very important.

7.2 G_{CMB} vs $G_{C\nu B}$

As proven in ㊱, force is connected to CMB and CνB. As shown in Fig. 3(b) of Ref. [1], force is composed of one particle that causes force (Gravino) and one particle that makes the shape of force (Neutrino). The CMB of left side in Fig. 7 is a type of Gravino, and the CνB of right side is a type of Neutrino. Therefore, it can be understood that both CMB and CνB affect the force. Due to the influence of CνB, such as bottle of neutron life measurement, G_{ν} 6.67430E-11 occurs.

In Fig. 1(m), three methodologies for calculating G_{γ} of CMB and $G_{\gamma\nu}$ of its mixture from G_{ν} of CνB are presented. Among them, ㊵ and ㊶ are judged to be correct, and their differences are calculated at ㊷. According to the experimental method, G_{ν} and G_{γ} are observed, and $G_{\gamma\nu}$ is judged to be the actual force acting.

7.3 Gravitational coupling constant

The gravitational coupling constant α_{G} from $G_{\gamma\nu}$ is calculated as ㊸, and this value was applied to the integration of four fundamental forces in Fig. 16(b) of Ref. [1]. In Table 1(10) of Ref. [2], the α_{G} was calculated as ㊹, and the error was 0.01%. It is calculated as ㊺, and the error is 0.0000%.

7.4 Wrong location?

In Fig. 7, the positions of CMB and CνB may have been switched. The values in this case are presented in ㊻.

8. Theory of Everything

8.1 Drawing of Everything

The language of physics should be pictures such as Fig. 1, not mathematics. If the picture drawn is true, the formula for calculating the picture can be derived naturally.

8.2 Calculation of Everything

The development of this formula is very easy, so anyone who is interested can understand it. However, there are some parts of the developed formula that are lacking in explanation. This is because we do not understand 4D and quantum space.

8.3 Six Variables Solving

The results of previous studies [1,2,3] were derived from six variables: Electron 510.998950 keV, Muon 105.658375 MeV, Proton 938.272089 MeV, Fine-structure constant 1/137.035999, Gravitational coupling constant 5.90595E-39, Z boson 91.1876(0.002%) GeV. The Ω_{Q} 72.916103% of ㊱ is judged to be the correct answer. From this, the Z boson mass will be calculated with an error of 0.0001%. The gravitational coupling constant α_{G} with the minimum error of ㊻, ㊼, ㉛, ㉝, ㉞, ㉟, and ㊺ will be the correct answer.

In the future, more verification formulas may be discovered. In the above verification formula, one or two formulas may be wrong, but not all of them can be wrong. The most important thing is to explain through pictures why the formula is the way it is.

9. Conclusions

Everything is divided into [Q]uantum state on the left of our universe, [E]vent state on the right, and [C]ombined state in the middle. In this study, the relationship between cosmological constant, Hubble constant, and dark energy ratio was derived, and from this, the dark energy ratio was calculated as [Q] 72.9138%, [E] 68.5741%, and [C] 70.1862%. CMB exists on the left side of our universe, and CνB exists on the right side of our universe, and these slightly affect the four fundamental forces.

All ratios including dark energy ratio are constant regardless of time flow. The cosmological constant of 1.106169E-52 /m2, the age of the universe of 13.784 BY, and the Hubble constant of 67.833 and 72.777 km/s/Mpc are parameters linearly proportional to time flow.

Based on the calculations in this study, all calculations of previous studies need to be re-performed. Especially, the formulas of Planck units require the clear distinction between [Q], [E], and [C]. When all formulas are clearly organized, the error of 0.0001% in all calculations can be realized.

Does the universe run on mathematical equations that no one can understand, or does it run on high school math equations? The former cannot draw the picture of universe, but the latter can draw the picture of universe.

References

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