The Complete Demonstrations To Our Universe Impossible To Be Created From Singularity

====Part 2: Our Universe Didn't Come From Singularity====

《Our Universe Was Originated From Planck Era, Not From Singularity Or The Big Bang Of Singularity . Just The Birth And Combinations Of Very Large Amount Of Minimum BHs $M_{bm} = m_p = 1.09\times10^{-5}$g Created Our Universe And Its Continuous Expansion Until The Present.》

对宇宙起源的新观念和完整论证:宇宙不可能诞生于奇点（下篇）

==== 我们宇宙诞生于在普郎克领域Planck Era新生成的大量原初最小黑洞$M_{bm} \equiv m_p = (hC/8\pi G)^{1/2} \equiv 1.09\times 10^{-5}$g 的合并，而不是“奇点”或“奇点的大爆炸”====

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Dongsheng Zhang 张洞生 Email: ZhangDS12@hotmail.com;

Nov.-2005 Graduated in 1957 From Beijing University of Aeronautics and Astronautics. China.

【Abstract】。 In this article, based on some general laws of astronomy, physics and many classical theories, the calculated results can prove that our present expansive Universe was impossibly born from Singularity or from the Big Bang of Singularity but from the Big Crunch of pre-universe in Plank Era. According to the principle of time symmetry, suppose before the birth of our universe, there could be a final Big Crunch of pre-universe. Once the final Big Crunch of pre-universe reached to Planck Era, i.e. time $t \leq [k_1 (2G\kappa)/C^5]^{2/3}$ (3c), $t = -0.5563\times 10^{-43}$s and temperature $T = 0.734\times10^{32}$k, every Planck particle (m_p) simultaneously reached 3 states: 1. Reached Planck Era; 2. The gravitational linkage between the closest particles broke off and the collapse stopped at the state of no gravity; 3. Every particle (m_p) at that moment would exactly become a minimum gravitational black hole ($M_{bm} = m_p = 1.09\times10^{-5}$g)。 Just those 3 states could effectively stop pre-universe continuously collapse to singularity, and let all M_{bm} explode in Planck Era. The strongest explosions of every M_{bm} in whole pre-universe synchronously formed a so-called the Big Bang. After that, the new and bigger $M_{bmn} = 2M_{bm}$ of longer lifetime could certainly occurrence due to decrease in density and temperature caused by the Big Bang. Newborn $2M_{bm}$ became the embryos of our present universe. It was the process of genesis of our present Universe. The collisions and combinations of all newborn $M_{bmn} = 2M_{bm}$ would create an “Original Inflation”, and form the present expansion of our universe. The whole process changed from the disappearance of old pre-universe to the genesis of new universe in Plank's Era was not reversible. Other important conclusions got in this article are those: Our universe has been a real universal black hole (UBH), which accords with all laws of general black holes (BH); Hubble law is just the expansive law of our universe to plunder energy-matters outside; the new and simple explanations and demonstrations to ” Original Inflation”, etc.

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【1】。 The Laws and formulas of Our Universal Evolution.

The laws of our universal evolution can be simply and precisely described by two different methods, which are based on the achievements of modern physics and astro-cosmology. [3][4][2]

First, Figure 1 specifies the numerical values of time (t) corresponding to Temperature (T) at different time in our universe's evolution.[3][4][2]

Second, Formulas (1a) below precisely describes our universe's evolution relevant from the Big Bang to Radiation Era in Figure (1), (from $t = 10^{-43}$ s to $t = 1/3\times10^6$ years). [3][4][2]

$Tt^{1/2} = k_1$, [4][3], $R = k_2 t^{1/2}$, $RT = k_3$, $R = k_4 \lambda$ (1a)

t—Characteristic Expansion Time, T—Temperature of Radiations, R— Characteristic Size or Dimension of the Universe, λ--Wavelength of Radiation, k_1, k_2, k_3, k_4—Constants,

Formula (1b) below precisely describes our universe's evolution relevant within the Matter-Dominated Era in Figure 1, (from $t = 1/3 \times 10^6$ years to the present).[3][4][2]

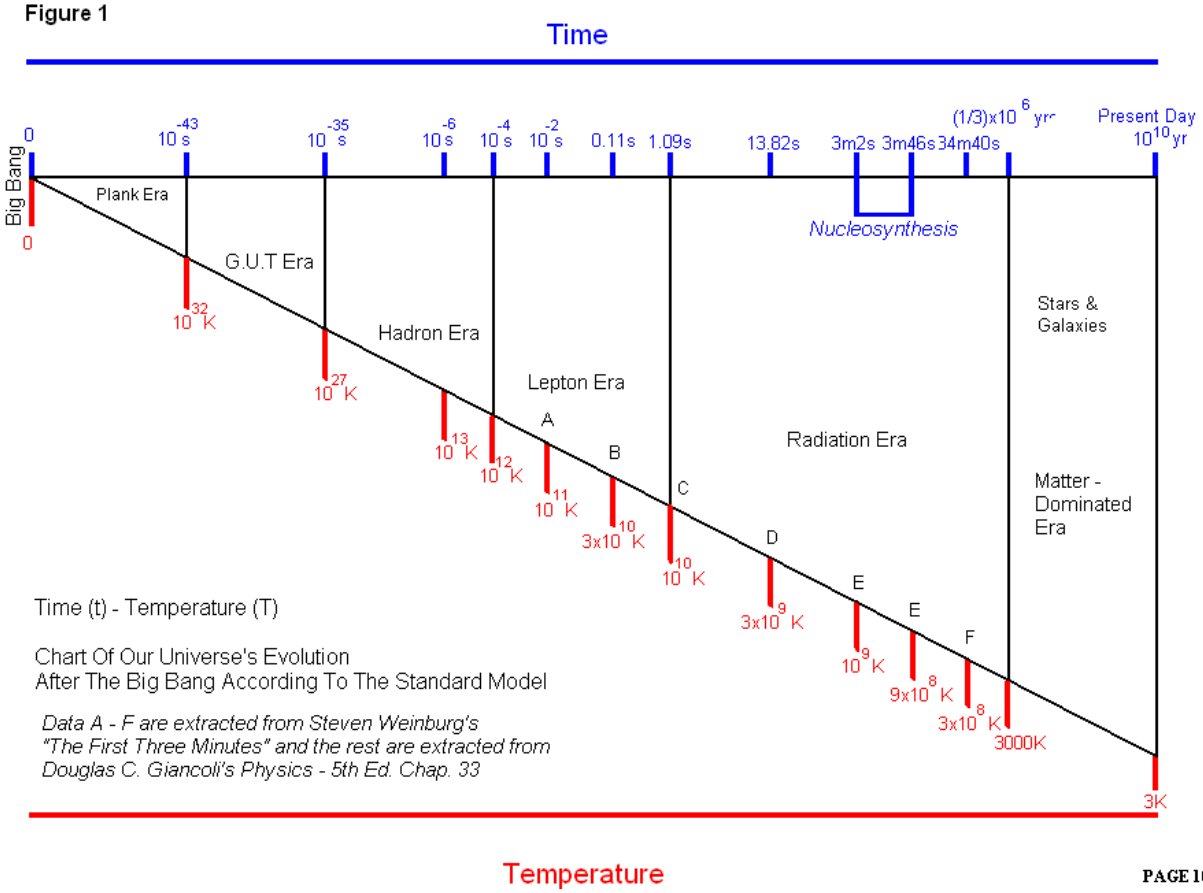
$Tt^{2/3} = k_6$,[4][3] $R = k_7 t^{2/3}$, $RT = k_8$, $R = k_9 \lambda$ (1b)

k_6, k_7, k_8, k_9 – Constants

$R = k_2 t^{1/2}$ in Formulas (1a) and $R = k_7 t^{2/3}$ in (1b) conform to cosmological principle, Newton's Mechanics and modern observations.

Right now, it has not been known all problems in Planck Era on the top of Figure 1 below by modern sciences, such as the micro structure, physical states and characters, the genesis of our universe in that Era. This article will describe and prove the mechanism of our universe born out from Planck Era.

Figure 1



For example, in Matter-Dominated Era, the numerical values below calculated out from Formula (1b) accord with the values on Figure 1 above。

$R_1/R_2 = (t_1/t_2)^{2/3}$, [3][4][6] $R_1T_1 = R_2T_2$, $R_1/R_2 = \lambda_1/\lambda_2$,

When $t_1 = (13 \times 10^9$yrs) to $t_2 = (4.0 \times 10^5$ yrs), $t_1/t_2 \approx 32{,}500$, $(t_1/t_2)^{2/3} \approx 1{,}000$

$R_1/R_2 = (12 \times 10^{27}$cm) / $(12 \times 10^{24}$cm) $\approx 1{,}000$

$T_1/T_2 = 3$K /3,000K $\approx 1/1{,}000$, $\lambda_1/\lambda_2 = 0.1$cm / 10-^{2}cm $\approx 1{,}000$,

From the beginnings of the Matter-Dominated Era to the present, the numerical values show that, as time (t) in the universal evolution enlarged 32,500 times, its size (R) enlarged 1,000 times, its radiant temperature (T) decreased 1,000 times, and wavelength (λ) of radiation increased in 1,000 times. The results above are consistent with the modern observations and MBR (Microwave Background Radiation).

【2】. About some essential natures and laws of black holes (BH), They must be obeyed by our universal black holes (UBH). [1] (see Part 1—<black holes> of this article in detail about the essential attributes of BHs)

1*. The minimum BH-- M_{bm}: According to Hawking radiation law of BHs and Schwarzschild special solution to GTRE and other classical formulas, the relationship of many physical parameters on the event horizon (EH) of BHs can be got as below: M_b –- mass of a BH, T_b –-temperature on EH of BH, m_{ss} –-mass of Hawking quantum radiation (HQR) on BH, R_b –- EH of a BH, h—Planck constant = $6.63\times10^{-27}g*cm^2/s$, C –-light speed =$3\times10^{10}$cm/s,, G –-gravitational constant = $6.67\times10^{-8}cm^3/s^2*g$, Bolzmann constant $\kappa = 1.38\times10^{-16}g*cm^2/s^2*k$, m_p –- Planck particle, L_p ---Planck length, T_p ---Planck temperature,

Hawking temperature formula on the event horizon (EH) of BH,

$T_b = (C^3/4GM_b)\times(h/2\pi\kappa) \approx 10^{27}/M_b$, [2] (2a)

Formula of energy transformation (i.e. gravitational energy can transfer into radiation energy through valve temperature) on EH of BH,

$m_{ss} = \kappa T_b/C^2$ [3] (2b)

According to Schwarzschild special solution to GTRE,

$GM_b/R_b = C^2/2$ [1][2] (2c)

From (2a) and (2b),

$m_{ss} M_b = hC/8\pi G = 1.187\times10^{-10}g^2$ (2d)

Formula (2d) is a general law effective on any EH of BHs. Furthermore, according to axiom of any part ≦the whole, m_{ss} is impossible > M_b, at the limited condition, the maximum m_{ss} = the minimum M_b, so, M_{bm} –minimum BH,

$m_{ss} = M_{bm} = (hC/8\pi G)^{1/2} = 1.09\times10^{-5}g$ [1] (2e)

Owing to $(hC/8\pi G)^{1/2} \equiv m_p$, [1][6] so,

$m_{ss} = M_{bm} = (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times10^{-5}g$. (2f)

$R_{bm} \equiv L_p$ [6] $\equiv (Gh/2\pi C^3)^{1/2} \equiv 1.61\times10^{-33}$cm (2g)

$T_{bm} \equiv T_p$ [6] $\equiv 0.71\times10^{32}k$ (2h)

$R_{bm} m_{ss} = h/(4\pi C) = 1.0557\times10^{-37}$cmg (2i)

The best important conclusion: When a BH could get into the gravitational collapse because of emitting Hawking quantum radiations (HQR) after engulfing all energy-matters outside, it would continuously shrink its size R_b, lose mass M_b, increase in T_b, and m_{ss} finally become a perfect minimum BH-- M_{bm} equal to Planck particle-- m_p, so, $M_{bm} = m_{ss} = (hC/8\pi G)^{1/2} \equiv m_p$, and explode and disappear in Planck Era,

2*. From formula (2l) below, an essential nature of BHs is that, once a BH was formed, no matter whether it absorbs in or radiates out energy-matters, or collides with other BHs, it will only be a BH forever until it finally contracts to a minimum BH— $M_{bm} \equiv m_p$. In other words, every BH to its owning , losing out and taking in energy-matters knows very clearly, and the event horizon (EH) as a precise recorder can revise its size at any moment as to suit the change of energy-matters in BH.

$2G M_b = C^2 R_b$ (2c)

$2GdM_b = C^2 dR_b$ (2j)

If there is another BH—M_{ba} to collide or combine with M_b, so,

$2G M_{ba} = C^2 R_{ba}$ (2k)

Formulas (2j) + (2k) + (2c), then,

$2G(M_b + dM_b + M_{ba}) = C^2(R_b + dR_b + R_{ba})$ (2l)

3*. The reasons of $M_{bm} \equiv m_p$ must explode, disintegrate and disappear in Planck Era.

Owing to once $M_{bm} < (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times10^{-5}g$, its $m_{ss} < 1.09\times10^{-5}g$, so, $m_{ss} M_b < hC/8\pi G < 1.187\times10^{-10}g^2$, it violates formula (2d), which is the general law of BHs.

Furthermore, according to Uncertainty Principle,

$\Delta E \times \Delta t \approx h/2\pi$ (2m)

To M_{bm}, $\Delta E = M_{bm} C^2 = \kappa T_b = 10^{16}$erg,

Δt = Compton time = $R_{bm}/C = 1.61\times10^{-33}/3\times10^{10} = 0.537\times10^{-43}$.

$\Delta E \times \Delta t = 10^{16}\times0.537\times10^{-43} = 0.537\times10^{-27}$, but $h/2\pi = 6.63\times10^{-27}/2\pi = 1.06\times10^{-27}$,

Obviously, $\Delta E \times \Delta t < h/2\pi$, it violates Uncertainty Principle. Thus, M_{bm} could impossibly exist, but only disintegrate and vanish in Planck Era, so, it has no way to contract to singularity.

【3】。The Transitive Condition Occurred from Big Crunch of Pre-universe to Big Expansion of Present Universe. Based on the principle of time symmetry, suppose the final collapse of pre-universe obeyed the same expansive law of our newborn universe.

From formulas (1a), (2b), $R = k_2 t^{1/2}$, when pre-universe contracted its size (R) to the Big Crunch, correspondingly its Temperature (T) would increase, and its time (t) would too much shorten. At an extreme circumstance, when (R) contracted to such an infinitesimal dimension, the real distance between two neighboring particles would finally become greater than the product of (C) (light speed) multiplied by time 2(t). It shows that there would not be time enough to transmit the gravity between neighboring particles. At that moment, all adjacent particles had to instantaneously break off the linkage of gravitational forces and lead the pre-universe to stop contraction and disintegration. No gravity between particles could certainly stop the contraction of particles. Thus, the pre-universe would change its state from the Big Crunch to the Big Expansion caused by the explosions of all $M_{bm} = m_p$ in "universal package". The strongest explosions of all $M_{bm} = m_p$ may be called "the Big Bang" in this article. After that, owing to decrease in density and temperature because of the explosions of old M_{bm}, the new $M_{bmn}=2M_{bm}$ could certainly be formed and become the embryos of our present universe. The combinations of newborn M_{bmn} created the "Original Inflation" at the genesis of our universe and the present universal expansion. That is the simple process of the birth of our present universe. Such a process is different with the Big Bang at an infinitesimal explosive point of Singularity known by most people. Of course, the detailed process of changing states should be extremely complicated in Planck Era.

The transitive condition occurred from the Big Crunch of pre-universe to the Big Expansion of the present universe is demonstrated by Formula (3) below.

$d_m \geqslant C\times[2t\,]$, i. e. $d_m/2C \geqslant t$, $-t \leq -d_m/2C$, $t = r/C$ (3)

t – Characteristic Expansion Time, d_m – Distance between two closest particles, C – Light Speed = 3×10^{10} cm/s,

Let ρ = energy-matter density g/cm^3, $M = 4\pi\rho R^3/3$, (3aa)

H = Hubble's Constant, $H = V/R = 1/t$,

From $4\pi\rho r^3/3 = m$, and $m = \kappa T/C^2$, [3] (2b)

$\therefore\ t^3 \leq 3\kappa T/4\pi\rho C^5$ (3a)

From $\rho = 3H^2/8\pi G = 3/(8\pi G t^2)$, [3] (3ba)

$\therefore\ t \leq T(2G\kappa)/(C^5)$, (3b)

From (1a), $Tt^{1/2} = k_1$ (3ca)

$\therefore\ t^{3/2} \leq k_1 (2G\kappa)/C^5$, or $t \leq [k_1 (2G\kappa)/C^5]^{2/3}$ (3c)

Formulas (3a), (3b), (3c) are all derived from Formula (3), and have the same value of (t).

Now the numerical value of (t) can be calculated as below. First, select two corresponding values (t) and (T) from Figure 1 into formula (1a) to get value of k_1, such as take $t = 10^{-43}$ s, and corresponding to $T = 10^{32}$K, from Figure 1, so,

$k_1 = Tt^{1/2} = 10^{32}\times10^{-43}\text{s} = 3^{1/2}\times10^{10} \approx 1.732\times10^{10}$, and from formula (3c),

$t^{3/2} \leq [(2G\kappa)/(C^5)]\times k_1 = 1.732\times10^{10}[(2G\kappa)/(C^5)$, (3cb)

$G = 6.67\times10^{-8}\text{cm}^3/g s^2$, $C = 3\times10^{10}$cm/s, $\kappa = 1.38\times10^{-16} g\text{cm/s}^2\text{K}$,,

$t^{3/2} \leq [(2\times6.67\times10^{-8}\times1.38\times10^{-16}) / (3\times10^{10})^5]\times 1.732\times10^{10})] = 0.075758\times10^{-74}\times 1.732\times10^{10} \approx 0.1312\times10^{-64}$,

$t^3 = 0.017217\times10^{-128} = 0.17217\times10^{-129}$, now let $t = t_m$ below for convenient calculations,

$t_m = 0.5563\times10^{-43}$s, (3d)

$\therefore\ t_m \leq 0.5563\times10^{-43}$s, and $t_m \geq 0.5563\times(-10^{-43})$ s, (3d)

Let $t = t_m$ be the disintegrated time of all particles m_m and pre-universe. Correspondingly,

$T_m = k_1/t^{1/2} = 1.732\times10^{10}/(0.5563\times10^{-43})^{1/2} = 0.734\times10^{32}$K, (3e)

mass of a particle m_m corresponding to above temperature 0.734×10^{32}K:

$m_m = \kappa T/C^2 = 1.38\times10^{-16}\times0.734\times10^{32}/(9\times10^{20}) = 1.125\times10^{-5}$g, (3f)

$\rho = 3/(8\pi G t^2) = 0.5786\times10^{93}$g/cm^3, (3g)

From formula (3aa), the radius r_m of m_m,

$r_m = (3m/4\pi\rho)^{1/3} = 1.67\times10^{-33}$cm, (3h)

$d_m = C\times[2t\,] = 3.34\times10^{-33}$cm, $d_m \geq 2r_m$ $(=3.34\times10^{-33}$cm) (3i)

$\therefore\ (d_m \geq 2r_m)$ (3j)

(3j) shows that, the gravitational links between two adjacent particles were surely broken,

The density ρ_u of the "universal package" formed by infinite particles m_m,

$\rho_u = m_m/d_m^3 = 0.302\times10^{93}$g/cm^3 (3k)

($\rho_u < \rho$) shows that, the density of pre-universe had a little decrease due to particles m_m disintegrated in whole

"universal package".

$m_m C^2 = 1.125 \times 10^{-5} \times 9 \times 10^{20} = 1.013 \times 10^{16}$, and $\kappa T = 1.38 \times 10^{-16} \times 0.734 \times 10^{32} = 1.013 \times 10^{16}$

$n_m = m_m C^2/\kappa T = 1$ (3l)

Formula (3l) indicates that, in the "universal package", the Crunched every particle m_m was a whole particle of no contracting forces inside. In addition, they were the broken gravitational links between adjacent particles m_m outside. Thus, the only way for all particles m_m of pre-universe could be only disintegrated into powders with pre-universe together at the highest temperature of 0.734×10^{32}K in "universal package",

Conclusions: The calculated values of ($t \leq 0.5563 \times 10^{-43}$s, $T = 0.734 \times 10^{32}$K) are almost equal to the beginning values of Planck Era in figure 1. It is said, once the Big Crunch of pre-universe collapsed into particles of above calculated values of ($m_m = 1.125 \times 10^{-5}$g, $r_m = 1.67 \times 10^{-33}$cm, $T_m = 0.734 \times 10^{32}$K), pre-universe reached Planck Era and all particles $m_m = m_p = M_{bm} = 1.09 \times 10^{-5}$g. No gravity is equal to no power for contractions of particles, so, all m_m could only be disintegrated into rays of the highest energy. and then $T_m \approx 10^{32}$ k become the highest temperature in Universe. With no gravity, the only way for the pre-universe and for all particles m_m had to stop their contraction and then started the expansion. Thus, pre-universe could only disappear in Planck Era, but have no way continuously to collapse to singularity.

Between $t = -10^{-43}$ s and $t = +10^{-43}$ s, there might be appearance of time (t = 0). However, time (t = 0) does not signify the presence of Singularity of infinite density at all, since at the virtual point of (t = 0), the temperature $T \approx 10^{32}$k, T was not infinity. The density $\rho \approx 10^{92}$g/cm$^3 \neq 0$, and the actual radius of universe $R \neq 0$. So, the virtual point of (t = 0) was just a bridge from contracted state ($t = -10^{-43}$s, +R) into expanded state ($t = +10^{-43}$s, +R). Above viewpoints let the universal evolution accord with the law of causality and the second law of thermodynamics as well as all classical theories and laws.

Owing to that, the "universal package" was formed by all particles m_m, their simultaneous disintegrations and explosions in Planck Era could certainly lead the disappearance of pre-universe as well as the space expansion and decrease in density inside. Probably, if people used to consider that, there must be a Big Bang as the genesis of our universe, then, the explosions of all above m_m and the disappearance of pre-universe might be called the "Big Bang" creating our present universe in this article. As the result, in the sealed "universal package", the tiny powders of the highest energy caused by exploded m_m had infinite opportunity to re-collide and re-combine into new particles and new minimum black holes (M_{bmn}). The presences of a large amount of new M_{bmn} could become the embryos of our new universe, their combinations created "Original Inflation" and our present expansive universe.

【4】. Minimum Gravitational (Schwarzschild) Black Hole (M_{bm}), Planck particles m_p and particles m_m above were all the perfect same thing, they came from final collapse of pre-universe. Formulas (4a) , (4b), (4c) and (4d) come from formulas (1f), (1g), (1h) and (1i). [1]

$m_{ss} = M_{bm} = (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09 \times 10^{-5}$g. (4a)

$R_{bm} \equiv L_p$ [3] $\equiv (Gh/2\pi C^3)^{1/2} \equiv 1.61 \times 10^{-33}$cm (4b)

$T_{bm} \equiv T_p$ [3] $\equiv 0.71 \times 10^{32}$k (4c)

$R_{bm} m_{ss} = h/(4\pi C)$ (4d)

Let's compare the numerical values between M_{bm}, m_p and m_m. m_m was particle of the final collapse of pre-universe in the state of no gravitational linkages between any two adjacent particles. M_{bm} was the minimum gravitational BHs come from the final collapse of BHs, they would finally become Planck particles m_p, and explode in Planck Era. [1]

Table 1: comparisons of numerical values between M_{bm}, m_p and m_m

m_m, of no gravity	M_{bm} –minimum BH	m_p–Planck particles [3]
$m_m = 1.125 \times 10^{-5}$g	$M_{bm} = 1.09 \times 10^{-5}$g	$m_p = 1.09 \times 10^{-5}$g,
$t_m = \pm 0.5563 \times 10^{-43}$s	$t_{bm} = 0.539 \times 10^{-43}$s	$t_p = 0.539 \times 10^{-43}$s,
$T_m = 0.734 \times 10^{32}$k	$T_{bm} = 0.71 \times 10^{32}$k	$T_p = 0.71 \times 10^{32}$k,
$r_m = d_m/2 = 1.67 \times 10^{-33}$cm	$R_{bm} = 1.61 \times 10^{-33}$cm	$L_p = 1.61 \times 10^{-33}$cm,

It can be seen from table 1, the numerical values of m_m have a little tolerance with values of M_{bm} and m_p. The reasons are that, m_m comes from formula (3f), but in the derived process, the numerical values of time t and

temperature T got from Figure 1 are not very precise. Thus, in reality, m_m should be completely equal to M_{bm} and m_p. So,

$$m_m \equiv M_{bm} \equiv (hC/8\pi G)^{1/2} \equiv m_p \qquad (4e)$$

It can be seen from (4e) that, particles m_m of the final collapse of pre-universe should be the same with minimum BHs--$M_{bm} \equiv m_p$. After m_m became Planck particles m_p, they could explode and disappear in Planck Era at once with the same results of $M_{bm} \equiv m_p$.[1]

【5】. After pre-universe disappeared in Planck Era, how could our universe be born out from Planck Era?

From (4e), once the final collapse of pre-universe came to Planck Era, all particles m_m in "universal package" would become minimum BHs-- $M_{bm} \equiv m_p$, and explode and disappear in Planck Era at once. That explosions could be so-called "the Big Bang" to the genesis of our universe。Energy-matters from pre-universe were the origination forming our universe. It may be said, no death of pre-universe, no energy-matters as the substantial foundation of our new universe.

How could our new universe be born from the ruins of pre-universe in Planck Era? The key problem is that, the waste energy-matters from disintegrated pre-universe could re-gather and re-form to new and stable minimum gravitational (Schwarzschild) BHs-- M_{bmn}.

Once pre-universe finally collapsed into Planck Era, which would have extreme high temperature of 10^{32}k and density of 10^{93}g/cm^3 in the sealed "universal package" . When all particles $m_m \equiv M_{bm} \equiv m_p$ exploded and formed the Big Bang, it could certainly created the space expansion and lowered the temperature and density of "universal package ".

Acceding to Hawking law (5a) of the lifetime τ_b of BHs due to emitting Hawking quantum radiations (HQR), M_b–mass of a BH, R_b–the event horizon of a BH, t_{bc}–Compton time, which indicates the necessary time to form a stable BH. The necessary condition to form a new stable minimum BH—M_{bmn} was as below.

$$\tau_b = 10^{-27} M_b^3 \text{ (s)} \qquad (5a)$$

$$t_{bc} = R_b/C \qquad (5b)$$

$\tau_b > t_{bc}$, i e. $10^{-27} M_b^3 > R_b/C$, from (2c),

$$M_b = M_{bmn} = 2.2\times10^{-5}\text{g} \ (\approx 2\ M_{bm}) \qquad (5c)$$

$T_b = (C^3/4GM_b)\times(h/2\pi\kappa) \approx 10^{27}/M_b = 0.45\times10^{32}$k,

From (5c) above, a $M_{bmn} \geq 2.2\times10^{-5}\text{g} \approx 2\ M_{bm}$ can be got. It is said, once the new and original $M_{bmn} \geq (2.2\times10^{-5}\text{g} \approx 2\ M_{bm})$ were formed and occurred, they could impossibly disappear again and only grow up with absorbing energy-matters of very high density outside or combine to other smaller BHs. How could M_{bmn} certainly occur? Owing to decrease in density and temperature in "universal package" occurred from the explosions of all particles $m_m \equiv M_{bm} \equiv m_p$ could lead: 1*. M_{bmn} could easily appear from combinations of two or more $M_{bm} = 1.09\times10^{-5}$g in Planck Era, because decrease in temperature let M_{bm} have the longer lifetime. 2*. From (2a) above, lower temperature could more easily form the bigger BHs, so, $M_{bmn} \approx 2\ M_{bm}$ would inevitably and easily be formed and become the stable embryos of our new universe. 3*。Particles smaller than M_{bmn} could grow up bigger and then collapse to M_{bmn} due to absorb energy-matters outside, just as a neutron star absorbs energy-matters enough outside to collapse a BH. 4*. Particles of mass more than M_{bmn} but density lower than M_{bmn} could contract its size to become a real M_{bmn}. 5*. In Planck Era of the highest temperature and density, energy and particles could only nonstop instantly transfer each others,

Once a M_{bmn} was formed, it could nonstop plunder energy-matters of the highest density outside or combine or collide with other M_{bmn}, and create the "Original Inflation". It just was the birth of our new universe. Thus, through expansions of 137×10^8years, the combined M_{bmn} grew up to a gigantic universal black hole (UBH) of 10^{56}g.

Conclusions: The genesis of our universe came from two key and necessary steps. First, the final explosions and disappearance of pre-universe with its all old $M_{bm} = 1.09\times10^{-5}$g in Planck Era provided the needed energy-matters for our universe and decreased in temperature and density in "universal package". Second, the new minimum stable BHs-- $M_{bmn} = 2.2\times10^{-5}$g could be formed to become the embryos of our newborn universe. It must be known, only new minimum stable BHs-- M_{bmn} as the embryos of our newborn universe can nonstop plunder

energy-matters outside and lead our universe to grow up bigger and bigger. In a word, no BHs as embryos, no our present gigantic universal BH appears, because only BHs can nonstop plunder energy-matters outside and keep them inside forever. According to the essential nature of BHs stated on above 【2】, once a BH was formed, it would be a BH forever until it finally contracted to become $M_{bm} \equiv m_p$ and vanished in Planck Era.

【6】。Our present universe is a real gigantic universal black hole (UBH) of $M_u = 10^{56}$g. The complete demonstrations are derived as below. The expansion of our universe is the results of collisions and combinations caused by a very large amount of M_{bm} or M_{bmn} .

1*. The real observational numerical values had demonstrated that, our universe is a ball to have various precise and reliable values. A, The real and precise age A_u of our universe is: $A_u = 13.7\times10^9$yrs.[8], then, the event horizon $R_u = C\times A_u = 1.3\times10^{28}$ cm, density $\rho_u = 3/(8\pi GA_u^2) = 0.958 \times 10^{-29}$ g/cm^3. so, the total mass of our universe is $M_u = 8.8\times10^{55}$g. B. Hubble constant is another reliable observational value, $H_o = (0.73\pm0.05) \times 100$kms^{-1}Mpc^{-1} [9], as a result, the density of our universe ρ_r : $\rho_r = 3H_o^2/(8\pi G) \approx 10^{-29}$g/cm^3. The age of our universe is: $A_r^2 = 3/(8\pi G\,\rho_r)$, $A_r = 0.423 \times 10^{18}$s = (13.4±0.67) $\times10^8$yrs. The total mass $M_r = 8.6\times10^{55}$g。

Thus, Mass of our universe has a very precisely observational value. For convenient calculations, let $M_u = 8.8\times10^{55}$g, $A_u = 13.7\times10^9$yrs, $R_u = 1.3\times10^{28}$ cm, $\rho_u = 0.958 \times 10^{-29}$ g/cm^3 below.

2*. If our present universe is a real gigantic universal black hole (UBH), it certainly came from the collisions and combinations of a very large amount of original M_{bmn} or $M_{bm} \equiv m_p = 1.09\times10^{-5}$g, its $R_{bm} = 1.61\times 10^{-33}$cm, its $T_{bm} = 0.71\times 10^{32}$k, its HQR $m_{ss} = 1.09\times10^{-5}$g. Let N_{bu} is numbers of our present universe M_u owning M_{bm}, then,

$$N_{bu} = M_u/ M_{bm} = 8.8\times10^{55}/1.09\times10^{-5} = 8.0734\times10^{60} \quad (6d)$$

If our universe is a real UBH formed from $N_{bu} \times M_{bm}$, then, $N_{bu} = 8\times10^{60}$ should be suitable with the same precise proportion of their event horizon as below (if let M_{bm1} replace M_{bm}, the same result can be got):

$$N_{bu} = R_u/R_{bm} = 1.3\times10^{28}/1.61\times 10^{-33} = 8.075\times10^{60} \quad (6e)$$

Owing to (6d) = (6e), it demonstrates clearly that, M_u are actually formed from $N_{bu}\times M_{bm}$, and M_u is a real UBH.

3*. The Hubble's law of universal expansion is just the expansive law of our UBH due to plunder energy-matters outside.

Apply Hubble's law to the boundary of our universal ball,

$$M_u = 4\pi\rho_o R_u^3/3 = 4\pi(3H_0^2/8\pi G)C^3 t_u^3/3 = 4\pi(3H_0^2/8\pi G)C^3t_u/3H_0^2 = C^3 t_u /2G = C^2 R_u /2G \quad (6f)$$

From Schwarzschild solution To GTRE, i.e. formula (2c), $2G M_b = C^2 R_b$

$$M_b = R_bC^2/2G = C^3 t_{bu} /2G = R_{bu}C^2/2G \quad (6g)$$

Right now, owing to $M_u = M_b$, $t_u = t_{bu}$, so, $R_{bu} = R_u$,. So, our universe is a real UBH, and the Hubble's law is just the expansive law of our UBH due to plunder energy-matters outside. When might $t_u \neq t_{bu}$? Once our UBH plunder all energy-matters outside in future, it can no more expand, Hubble law will be no longer effective, then, the universal age $t_u >$ Compton time t_{bu} of our UBH.

4*. So-called "Flatness" ($\Omega = \rho_r / \rho_o \approx 1$) of our universe is really just the essential nature of any BHs included our UBH. Our universe as a real UBH is certainly a sealed giant ball. To any BH, the exact amount of ρ_b must correspond to an exact amount of M_u, so, $\Omega = \rho_r / \rho_o = 1$ is a certain result. Therefore, the argument about ($\Omega = \rho_r / \rho_o \approx 1$) in scientists over 50 yrs is really a false proposition.

Owing to the wrong proposition of ($\Omega = \rho_r / \rho_o \neq 1$), it led a lot of scientists to propose some wrong concepts, such as "Seeking lost energy-matters", "zero energy" and "dark energy", etc. It can be seen from formulas (6d) and (6e), Our UBH has not lost any energy-matters at all, , but only has matters not found out.

From now on, if no energy-matters outside to be plundered, our UBH will no more expand, and start to emit HQRs, contract its size very and very slowly. According to Hawking law of lifetime of BHs (5a), the lifetime τ_b of our present universe will be about $\tau_b = 10^{-27} M_b$ (s) $= 10^{-27} (8.8\times10^{55})^3 \approx 10^{132}$yrs, due to emitting HQRs to finally become M_{bm} to disappear in Planck Era. If there are energy-matters outside, our UBH will plunder all energy-matters, and then emit HQRs to contract its size. Thus, the lifetime of our UBH will be much longer than 10^{132}yrs until it contracts to M_{bm} and disappears in Planck Era.

【7】。In this paragraph, author propose a newest and simplest principle to calculate the mechanism, process and terminal of "Original Inflation". it caused from "combinations of the newborn minimum BHs--M_{bm}". Once all M_{bm} in our universe M_u were linked together to a "universal package", "Original Inflation" would go to the end, "universal package" had to turn into slower conventional expansion until to the present.

Let t_o be the time needed by all N_{bu} ($=8.8\times10^{60}\approx10^{61}$)$\times M_{bm}$ linking them together in the "universal package" in the newborn period of our universe, the total mass M_u of our present UBH is $M_u = 8.8\times10^{55}$g, which formed and expanded from original minimum BHs-- $M_{bm} \equiv m_p = 1.09\times10^{-5}$g, i.e. $M_u = N_{bu}\times M_{bm}$. Therefore, after "Original Inflation", our universal expansion was just the completely expansive result of $N_{ub}\times M_{bb2} = 2.2\times10^{40}\times 4\times10^{15}$ (7-4)(7-6) through their combinations of 137×10^8yrs.

For convenient calculations, let $M_{bmn} = M_{bm}$. Now let's know how $N_{bu}\times(M_{bm}\approx10^{-5}$g) could combine them together. $R_{bm} = 1.61\times10^{-33}$cm was the event horizon of M_{bm}. Suppose a newborn M_{bm} wanted to combine its adjacent companions in (2 or 3) times t_{bmc}, t_{bmc} is Compton time of M_{bm}, $t_{bmc} = R_{bm}/C = 1.61\times10^{-33}/3\times10^{10} = 5.37\times10^{-44}$s. In case light (gravity) went through $2\times t_{bmc}$, M_{bm} should link with numbers N_{bm2} of M_{bm}, so,

$$N_{m2}\, R_{bm}{}^3 = (2R_{bm})^3,\ \therefore\ N_{m2} = 8 \qquad (7a)$$

Formula (7a) shows, when t_{bmc} prolonged to 2 t_{bmc}, M_{bm} would link with other 8 M_{bm}. How long could M_{bm} link with all $N_{bu} = 8.075\times10^{60}$ of M_u ($=N_{bu}\, M_{bm}$)?

$$N_{bu} = 8.8\times10^{60}\approx10^{61} = (8^{67.5}) \qquad (7b)$$

Formula (7b) shows, after original M_{bm} went through $(2^{67.5})\times t_{bmc}$, all N_{bu} ($=8^{67.5}\approx10^{61}$)$\times M_{bm}$ would be linked together to become an original "universal package" of M_u. However,

$$(2^{67.5})\approx(10^{20.3}),\ \text{let}\ n_{o2} = 10^{20.3} \qquad (7c)$$

Now, with the same way to get $N_{m3} = 27$,

$$N_{m3}\, R_{bm}{}^3 = (3R_{bm})^3,\ \therefore\ N_{m3} = 27 \qquad (7d)$$

$N_{bu} = 8.8\times10^{60}\approx10^{61} = (27^{42.6})$, and $(3^{42.6})\approx(10^{20.3})$, let $n_{o3} = 10^{20.3}$,

$$\therefore\ n_o = n_{o2} = n_{o3}\approx(10^{20.3}) \qquad (7e)$$

From formulas (7a) and (7d), regardless how many times t_{bmc} could prolong, the needed time to link all M_{bm} together was the same time-- $n_o\times t_{bmc}$. However, owing to that, the combinations of all M_{bm} certainly created the biggest space expansion, it was just "Original Inflation". According to the essential nature of BHs and formula (2c), in (7a), combinations of 8 same BHs certainly created 8 times space expansion of the event horizon R_{bm}, so, $8 = 2^3$. Under the similar condition, in (7d), $27 = 3^3$. It is said, when time from t_{bmc} prolonged to 2 t_{bmc}, the combined numbers of M_{bm} was not 2^3, but $(2^3)^3 = 2^9$. when time from t_{bmc} prolonged to 3 t_{bmc}, the combined numbers of M_{bm} was 3^9.

Furthermore, with the same way to get a general law of n_o,

Let $N_{mn} = n_o{}^9$, and $n_o = 10^x$ (7f)

But $N_{bu}\approx10^{61}$, $\therefore 10^{61} = 10^{9x}$ (7g)

$x_1 = 61/9 = 6.8$, $\therefore$ $n_{o1} = (10^{6.8})$ (7-1a)

Formula (7-1a) shows , under the condition of "Inflation", t_{bmc} only needed to prolong $n_{o1} = 10^{6.8}$ times to link all M_{bm} tohether. Now, according to same principle of (7-1a) , x_2 and n_{o2} can be got from (7e), it was the condition of "no Inflation", it may be called as "conventional expansion".

$x_2 = 61/3 = 20.3$ $\therefore$ $n_{o2} = 10^{20.3}$ (7-1b)

$\therefore n_{o2} = n_{o1}{}^3$ or $n_{o2} = 10^{13}\, n_{o1}$ (7-1c)

1*。 Formulas (7-1a) and (7-1b) indicate that, there could be 2 ways to link all M_{bm} together in M_u, the needed time of 2 ways are all decided by value of M_u.

A. "Original Inflation": t_{o1} was time of the end of "Original Inflation",

$t_{o1} = t_{bmc}\times n_{o1} = 5.37\times10^{-44}\times10^{6.8} = 0, 2\times10^{-36}s=2\times10^{-37}$s。 (7-2a)

B. " conventional expansion": t_{o2} was time of the end of " conventional expansion",

$t_{o2} = t_{bmc}\times n_{o2} = 5.37\times10^{-44}\times10^{20.3} = 2\times10^{-24}$s (7-2b)

$\therefore\ t_{o2}/t_{o1} = n_{o2}/n_{o1} = 2\times10^{-24}/2\times10^{-37} = 10^{13}$ (7-2c)

The event horizon R_{bb2} or R_{bb1} of little BHs-- M_{bb2} or M_{bb1} created after time of t_{o2} or t_{o1},

$R_{bb1} = C\, t_{o1} = 6\times10^{-27}$cm (7-3a)

$R_{bb2} = C\, t_{o2} = 6\times10^{-14}$cm (7-3b)

$R_{bb2}/R_{bb1} = 10^{13} = t_{o2}/t_{o1} = n_{o2}/n_{o1} = n_{o1}{}^2$ (7-3c)

2*. From (7-2a) and (7-2b), the newborn M_{bm} might have 2 ways to link all M_{bm} in M_u together and created 2 kinds of great expansions to become to little BH--M_{bb2} or M_{bb1}, A 。 "Original Inflation" : from (7-2a), "Original Inflation" can be considered, the event horizons R_{bb1} of newborn little BHs-- M_{bb1} made the total

"Inflation" of n_{o2}/n_{o1} included its conventional expansion，after "Inflation of $t_{o1} = 2\times10^{-37}$s, $R_{bb1}\times n_{o2}/n_{o1}$ turned equal to $R_{bb2} = 6\times10^{-14}$cm, so, 2×10^{-37}s was the end of "Original Inflation". B。" conventional expansion": Through. " conventional expansion" created by the combinations of all M_{bm} to form little BHs-- M_{bb2}, after $t_{o2} = 2\times10^{-24}$s, R_{bb2} of M_{bb2} reached to 6×10^{-14}cm.

Conclusions：Above A and B reached the same results to form $M_{bb2} = M_{bb}$, and $R_{bb2} = R_{bb1}$. The sole defference between both is , "Original Inflation" was prior to "conventional expansion" to form M_{bb1}. M_{bb1} was formed at the end of 2×10^{-37}s, but M_{bb} at the end of 2×10^{-24}s.

3*。The other parameters of M_{bb1} and M_{bb2}； known number; $R_{bb2} = C\,t_{o2} = 6\times10^{-14}$cm，

$M_{bb1} = M_{bb2} = 0.675\times10^{28}\ R_{bb2} = 4\times10^{15}$ g (7-4)

$\rho_{bb1} = \rho_{bb2} = 3M_{bb2}/(4\pi R_{bb2}^3) = 4.4\times10^{54}$ g/cm^3. (7-5)

At the time of $t_{o1} = 0{,}2\times10^{-36}$s or $t_{o2} = 2\times10^{-24}$s， density ρ_{bb} of M_u was equal to ρ_{bb2} of M_{bb2}, the event horizon R_{ub} of M_u was:

$R_{ub} = (3M_u/4\pi\rho_{bb2})^{1/3} = 2.4$ cm (7-6)

$N_{ub} = M_u/M_{bb2} = 8.8\times10^{55}/4\times10^{15} = 2.2\times10^{40}$

$N_{bbm} = M_{bb2}/M_{bm} = 4\times10^{15}/1.09\times10^{-5} = 4\times10^{20}$ (7-7)

4*。Now, let's study the real conditions of "Original Inflation". According to the informations and calculations in paragraph 12.7 of《New Instruction to Astronomy》,[3] from formula（1a）$R = k_1 t^{1/2}$, R is Characteristic Size the Universe, t is Characteristic time, at the time of $t = 10^{-36}$s，the universal size $R_{-36} = 3.8$ cm after "Original Inflation", At that time, the universal density $\rho_{bbb} = 3.8\times10^{53}$g/cm^3, the size R_{-44} of our universe at $t = 5.37\times10^{-44}$.

$R_{-36} = 1.83\times10^{25}\text{cm}\times(10^{-36}\text{s})^{1/2}/(7\times10^5\times3.156\times10^7\ \text{s})^{1/2} = 3.8$ cm [3] (7-8)

$\rho_{bbb} = 3M_u/(4\pi R_{-36}^3) = 3.8\times10^{53}$g/cm^3 [3] (7-9)

$R_{-44} = (3M_u/4\pi\rho_u)^{1/3} = 10^{-13}$ cm (7-10)

$R_{-36}/R_{-44} = 3.8/10^{-13} = 3.8\times10^{13}$ (7-11)

Above numerical values about "Original Inflation" have broad typical case. It pointed out, when $t = 10^{-36}$s，the size R_{-36} of universe increased in 10^{13} times，the volume suddenly rose 10^{40} times。

5*。Conclusions: A。The universal size 3.8 cm in (7-8)，and the universal size 2.4 cm got by author in (7-6) are all after "Inflation" of $t = 10^{-36}$s, the numerical values of 3.8 cm and 2.4cm are very approximate. It indicates that, the mechanism, process and terminal of "Original Inflation" proposed by author are all right, i.e. the combinations of all BHs surely created "Original Inflation", which terminal was just all BHs in M_u to be linked together and formed new little BHs—M_{bb1}. B。Owing to "Original Inflation" caused before the universal time of $t = 10^{-24}$s, it might impossibly be observed by mankind forever. If "Original Inflation" before 10^{-36}s would be denied in future, the "conventional expansion" before 10^{-24}s should be recognized. Through calculations in detail in this article, that our universe was come from minimum BHs--M_{bm} should be a convincing proposition. In reality, "conventional expansion" was also a "slower Inflation".

6*。From Figure 1 of page 2，$t_o = 0.2\times10^{-36}$s was in GUT Era。

【8】. Simple Reviews to Our Universe in the past, at present and in future

Our present universe is a gigantic universal black hole (UBH).

The age of our universe is: $A_u = 137\times10^8$years,

Schwarz child's radius of universe: $R_u = 1.3\times10^{28}$ cm,

Density $\rho_u = 3/(8\pi GA_u^2) = 0.958\times10^{-29}$ g/cm^3.

The total mass of our universe is $M_u = 8.8\times10^{55}$g.

If no energy-matters outside, the lifetime of our present universe may be: $L_u \approx 10^{132}$yrs. If there still are energy-matters outside our present universe to be plundered, then, $L_u >> 10^{132}$yrs.

Our universe was born from new $M_{bm} = (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times10^{-5}$g, The expansion of our universe was originated from the combinations of a large amount $N_{bu} = 8\times10^{60}$ of new M_{bm}.

The size of our original Universe of M_u in Planck Era looks like the size of a present proton $R_{u0} = 1.54\times10^{-13}$ cm,

The numbers of proton mass of the Universe are; $N_{op} = M_u/m_{proton} = 10^{56}/1.67\times10^{-24} \approx 10^{80}$.

After the end of "Original Inflation" at the universal expansive time of 0.2×10^{-36}s, due to all M_{bb} in M_u had linked together, the expansion of our universe was a conventional expansion due to decrease in temperature and density of all ($N_{bb} = 0.33\times10^5$) M_{bb}.

Mankind has exactly lived in the gigantic universal black hole (UBH), a great number of small and big black holes have scattered in the boundless universal space.

【9】. The further explanations, analyses and conclusions:

1*. Singularity is defined a point of infinite density. The conditions of point structure, no resistance (exclusive forces) and universal model of zero pressure in General Theory of Relativity Equation (GTRE) would certainly lead the occurrence of singularity in a contracted ball of definite energy-matters. It was demonstrated from GTRE by S•Hawking and R• Penrose 40 years ago that, our universe was born from singularity or the Big Bang of singularity, and singularity would certainly occur in BHs. In this article, applying Hawking laws about BHs which is based on quantum mechanics and thermodynamics, author has successfully demonstrated and derived out the new and important formula (3c)--$t^{3/2} \leq k_1(2G\kappa)/(C^5)$, and calculated out accurately the time (t) of final collapse of pre-universe into Planck Era. Once pre-universe finally collapsed to $t \approx -0.5563\times10^{-43}$s, all particles in pre-universe became minimum BHs of $M_{bm} = (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times 10^{-5}$g, which could prevent pre-universe continuously to collapse to singularity and create new minimum BHs-- M_{bmn}. The new M_{bmn} occurred from Planck Era, would become the embryos of our newborn universe, their combinations created our present expansive universe.

2*. In reality, John & Gribbin pointed out in his book—<Companion To The Cosmos>: "Our universe might originate from such particles-- $M_{bm} \approx 10^{-5}$g." [<7>] " （Planck Era ）was really the state at genesis of our universe." [<7>] In this article, author may just better demonstrated John & Gribbin's above suppositions with correct Hawking laws about BHs through the more precise calculations.

3*. Our present universe is a real universal BH (UBH), it completely accords with the laws of general BHs. Hubble law better reflects the expansive law of our universe come from the combinations of original M_{bm} and to engulf energy-matters outside.

4*. The "Original Inflation" of our newborn universe was created by the combinations of all adjacent minimum BHs--M_{bm} of our universe. The end of "Original Inflation" was at universal time $t_{bb} = 0.2\times10^{-36}$s. That mechanism of "Original Inflation" is firstly proposed and demonstrated in this article.

5*. Whether our present universe expand or not in future will not be decided by the real density ρ_r, but only be decided by energy-matters outside the present event horizon of our universe. If there are still energy-matters outside, our universe will continuously expand, and in turn if no energy-matters outside, our universe will contract. Our universe as a UBH, $\rho_r = \rho_c$ or $\Omega = 1$ is its essential nature. Therefore, $\rho_r \neq \rho_c$ or $\Omega \neq 1$ was a false proposition by the most scientists in the past.

6*. The four difficult and complicated problems (Singularity, flatness, Event Horizon and magnetic monopole) at the genesis of our universe had troubled scientists for several decades. After author has negated the occurrence of Singularity and proved the flatness is the essential nature of our UBH in this article, the other two problems may be easily solved. Moreover, the new concepts in this article have given the better explanations to "Original Inflation".

7*. If the new concepts in this article could exclude the occurrence and existence of Singularity at the genesis of our universe, scientists will not need to beg the marvels or to provide some special original conditions for solving the complicated GTRE in future.

8*. All numerical values calculated from Hawking theory about BHs and classical theories and its formulas in this article are precisely consistent with the observational results and the real evolutionary process of our universe in Figure 1. Probably, the new concepts in this article may not be accepted and convinced by the most scientists and scholars, because of no abstruse theory, no complicated mathematical equations as well as the old conventions not broken down. However, as a reasonable explanations to the genesis of our universe, new concepts in this article are much better than "Big Bang" of Singularity, because people do not need to be puzzled by uncertain Singularity.

====The End====

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对宇宙起源的新观念和完整论证:宇宙不可能诞生于奇点（下篇）
==== 我们宇宙诞生于在普郎克领域Planck Era新生成的大量原初最小黑洞$M_{bm} \equiv m_p = (hC/8\pi G)^{1/2} \equiv 1.09\times 10^{-5}g$ 的合并，而不是“奇点”或“奇点的大爆炸” ====

张 洞 生 Dongsheng Zhang E-mail: *ZhangDS12@hotmail.com* **2/10/2009**

1957 年毕业于北京航空学院,即现在的北京航天航空大学

笛卡儿：“我们不能依赖他人的权威而接受真理，必须自己寻求。”

【内容摘要】：本文根据近代宇宙天文学和物理学的一些基本规律和公式,通过计算所得的数据，证明了我们现在膨胀的宇宙不可能诞生于“奇点”或“奇点的大爆炸”。按照时间对称原理，假设我们宇宙是从前辈宇宙的“大塌缩”而来，其最后的塌缩规律与我们宇宙诞生时的膨胀规律相同，那么，本文中新推导出前辈宇宙的“大塌缩”公式. (3c)式就是来的最重要的公式，一旦前辈宇宙大塌陷到(3c)，$t \le [k_1(2G\kappa)/C^5]^{2/3}$，即 $t = -0.5563\times 10^{-43}$s秒和宇宙最高温度$T = 0.734\times 10^{32}$k时，前辈宇宙中的每个能量-物质粒子m同时进入3种状态：1。每个粒子m都与其相邻的粒子因无足够时间转递引力而失去了引力联系以至于无法继续塌缩。2。每个粒子m都变成为$M_{bm}\approx 10^{-5}$g的史瓦西最小黑洞。3。同时进入普郎克领域而成为普郎克粒子m_p，于是，$m = M_{bm} = m_p = 1.09\times 10^{-5}$g.正是“宇宙包”内每个粒子m 的这3种状态的共同作用，导致所有的m在封闭的“宇宙包”内停止收缩而爆炸解体，并与整个前辈宇宙同步消失在普朗克领域，从而共同阻止了前辈宇宙在普朗克领域继续塌缩成为“奇点”。同时，前辈宇宙的爆炸解体造成“宇宙包”内的温度和密度的下降，从而使宇宙中新生出来稍大而稳定的无数最小黑洞 $2M_{bm}$。它们就成为我们现在新宇宙的“胚胎”，它们的合并就是我们宇宙的诞生，同时造成了我们新生宇宙诞生后在 $t_0 < 2\times 10^{-37}$前的“原始暴涨”，并形成许多更大的“小黑洞”将宇宙连接成一个整体。这些“小黑洞”的继续合并膨胀就形成了我们现在膨胀的宇宙。

本文还完全证实了我们现在宇宙是一个真实的宇宙大黑洞(UBH)，这样，宇宙诞生和演化中的各种难题就简化成为一般黑洞的生长衰亡规律。,本文还论述了从前辈宇宙的大塌缩到我们新生宇宙大膨胀的转变过程。还首次提出了产生宇宙的“原初暴涨”新的机理，并做出了新的解释、论证和计算。 [New York Science Journal. 2009;2(3):79-100]. (ISSN: 1554-0200).

本文中唯一的最简单的假设就是按照时间反演和对称规律，推断我们宇宙的诞生来源于前辈宇宙的最后大塌缩。这种假设也是最简单而符合奥康姆剃刀(Ockham’s razor)原则的。不像“奇点”那样不可理解，无法计算出与现今宇宙参数之间的任何有规律关系。 本文所有的结论和计算结果都符合因果律：凡是有开端的事实都有原因。也完全符合现有的经典理论的基本公式的计算数据和近代天文物理的观测数据和结论。 (< >参考文献编号)

【关键词】：宇宙不是产生于“奇点”或者“奇点的大爆炸”；宇宙诞生于($M_{bm}\approx 10^{-5}$g)史瓦西最小黑洞；宇宙的 “原初暴涨”（Original Inflation)产生于大量最小黑洞的合并；宇宙与黑洞的同一性；我们宇宙本身就是一个宇宙大黑洞；哈勃定律就是宇宙黑洞的膨胀规律；

【1】. 我们宇宙的演化规律与公式：(图一)

宇宙的演化规律可用两种不同的简单方式较精确地描述。这是根据粒子物理学和近代天文观测的成就而得出的结果.通称之为宇宙”大爆炸”标准模型。

首先,图一详细地标列出了宇宙在各个不同时期的演化过程中时间t与温度T的相互对应的关系，其各种数据简明，但不精确，而是近似的.<3><4><2>

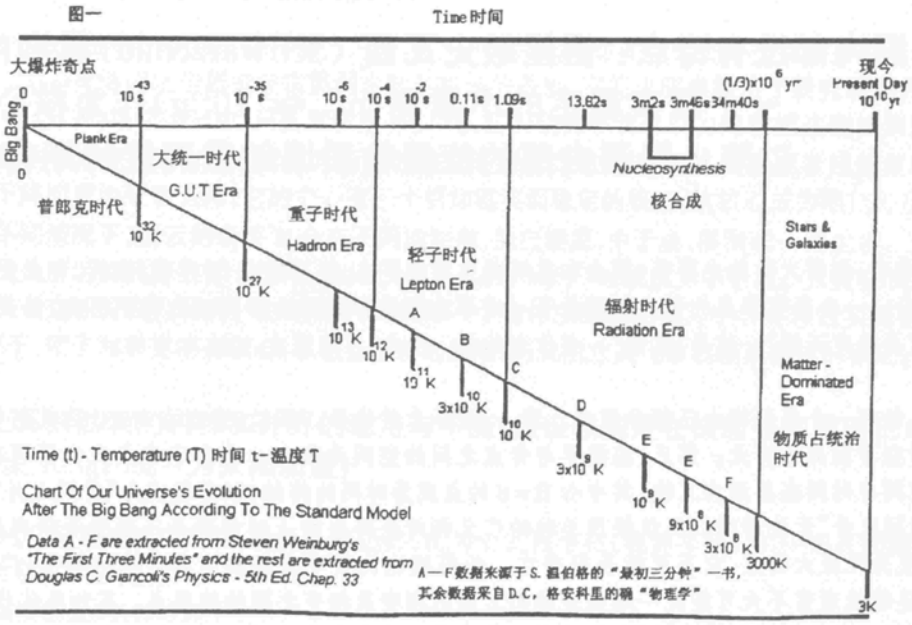
其次，下面的公式(1a)从量上定出了宇宙从辐射时代末期到大爆炸的过程中各个物理状态参数间的变化规律：（$t=\pm10^{-43}$秒到$t=1/3\times10^{6}$年）

$Tt^{1/2}=k_1$, $R=k_2t^{1/2}$, $RT=k_3$, $R=k_4\lambda$,<3><4><6> (1a)

t—宇宙的特征膨胀时间, R—宇宙的特征尺度或大小, λ—辐射的波长, T—宇宙辐射温度, k_1,k_2,k_3,k_4—常数.

图一， 宇宙演变的标准模型中温度 T 与时间 t 的关系;<2>

9. 附录 A: 图一,宇宙演变的标准模型中温度 T 与时间 t 的关系;



附录 A 宇宙演变的标准模型中温度 T 与时间 t 的关系

下面的(1b) 式定出了宇宙在物质占统治地位时代各物理状态参数之间的变化规律和相互关系($t=1/3\times10^{6}$年到现今)

$Tt^{2/3}=k_6$, $R=k_7t^{2/3}$, $RT=k_8$, $R=k_9\lambda$,<3><4><6> (1b)

T, t, R, λ—同上, k_6,k_7,k_8,k_9,—常数。(1a)和(1b)也很难十分准确第定出其各常数。

上式$Tt^{1/2}=k_1$和$Tt^{2/3}=k_6$.可参考 S. Weinberg 的 "最初三分钟"之附录.如果将图一中的数值与按照(1a)(1b)式中计算出来的数据相比较,其结果是相当一致的，图一中的数值不可能准确到小数点后 1 位数，所以是近似的。宇宙演化的这两组数据的一致性表明用(1a)(1b)规律来表述宇宙的演化是正确的,与建立在近代粒子物理基础上的标准宇宙模型相符合.而且这些数据也与近代的天文观测数据MBR（微波背景辐射）相吻合.我们如果给出一组宇宙演化的初始值或特定值，就可以取代(1a)(1b)中的各个常数$k_1\cdots\cdots k_9$，从而可以算出对应于宇宙演化各个时间t相对应的的其它各参数如T, R,…。作为例子，我们用(1b)计算宇宙在物质占统治时代的各个物理参数的变化, 按照公式 (1b),

$R_1/R_2=(t_1/t_2)^{2/3}$, $R_1T_1=R_2T_2$, $R_1/R_2=\lambda_1/\lambda_2$, $T_1/T_2=(t_2/t_1)^{2/3}$,

如取 $t_1=13\times10^{9}$yrs, $t_2=4\times10^{5}$ yrs, 则 $t_1/t_2\approx32{,}500$, $(t_1/t_2)^{2/3}\approx1{,}000$.

取$R_1=12\times10^{27}$cm, 则$R_2=R_1/1{,}000=12\times10^{24}$cm, 取 $T_1=3$K,则 $T_2=3{,}000$K, 取$\lambda_1=0.1$cm, 则 $\lambda_2=10^{-4}$cm.

以上各参数的初始值可见于图一,算出结果与近代观测数值相吻合。以上数值表明宇宙从物质占统治时代的最初时刻膨胀至今, 时间膨胀了约 32,500 倍,尺寸扩大了约 1,000 倍，温度则降低约 1,000 倍，辐射波长增长约 1,000 倍，符合 MBR(微波背景辐射)的观测数据。

由于我们宇宙在创生期的密度异常大，那时的宇宙好似 "原子" 般的大小。关键问题在于这颗 "原子" 从何而来？来源不外乎两个：(一)，按照广义相对论，宇宙是从所谓的"奇点大爆炸"爆炸膨胀而来,从无到有,此路不通.因为它无法解释一个各种物理定律失效的 "奇点" 与一个如此有序的宇宙有任何物理量之间的

联系。(二)，二是认为这颗“原子”由前辈宇宙收缩的大塌陷经过 “相变”转变而来。本文的论证与计算就在于确证宇宙如何从前辈宇宙的“塌陷相”转变为现今宇宙“膨胀相”，这种相变发生的条件机理和途径。

【2】. 黑洞的基本属性和黑洞在其视界半径R_b 的守恒公式。我们宇宙是一个真实的“宇宙黑洞”。所有黑洞在其视界半径上的公式完全适用于我们“宇宙黑洞”。 (此节请参看本文上篇)[1]

1*. 最小黑洞-- M_{bm}: 根据霍金黑洞量子辐射的温度公式和史瓦西的黑洞公式，可以推导出来黑洞M_b在其视界半径R_b 上准确的 4 个守恒公式，它们规定出所有黑洞的生长衰亡规律。

M_b –-**黑洞质量**, R_b –-黑洞的视界半径，T_b –-黑洞视界半径R_b **上温度，** m_{ss} –-黑洞视界半径R_b **上霍金辐射量子**, h—**普朗克常数** = $6.63\times10^{-27}g*cm^2/s$，, C –-**光速** =$3\times10^{10}$cm/s,, G –-**引力常数** = $6.67\times10^{-8}cm^3/s^2*g$, 波尔兹曼常数--κ = $1.38\times10^{-16}g*cm^2/s^2*k$, m_p -- **普朗克粒子**, L_p ---**普朗克长度**, T_p ---**普朗克温度**,

霍金黑洞量子辐射的温度公式,

$T_b = (C^3/4GM_b)\times(h/2\pi\kappa) \approx 10^{27}/M_b$, <2> (2a)

黑洞在其视界半径R_b 的阀温和能量转换公式，

$m_{ss} = \kappa T_b/C^2$ <3> (2b)

按照史瓦西的黑洞公式，即对广义相对论方程的特殊解，

$GM_b/R_b = C^2/2$ <1><2><3> (2c)

从 (2a) 和 (2b)**得出，**

$m_{ss}M_b = hC/8\pi G = 1.187\times10^{-10}g^2$ (2d)

公式 (2d) 是在黑洞的视界半径R_b上普遍有效的公式。运用宇宙中事物部分不大于全体的公理。黑洞视界半径R_b **上霍金辐射量子**m_{ss}**不可能 >黑洞质量**M_b, **在极限情况下，最大的**m_{ss} **只能=最小的黑洞**M_{bm} **，所以有，**

$m_{ss} = M_{bm} = M_b = hC/8\pi G)^{1/2} = 1.09\times10^{-5}g$ <6> (2e)

由于$(hC/8\pi G)^{1/2}$ ≡普朗克粒子 m_p, <6> 所以,

$m_{ss} = M_{bm} = (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times10^{-5}g.$ (2f)

$\therefore R_{bm} \equiv L_p$ <6> $\equiv (Gh/2\pi C^3)^{1/2} \equiv 1.61\times10^{-33}$cm(2g)

$\therefore T_{bm} \equiv T_p$ <6> $\equiv 0.71\times10^{32}k$ (2h)

$\therefore R_{bm}m_{ss} = h/(4\pi C) = 1.0557\times10^{-37}$cmg (2i)

最重要的结论:当一个黑洞因为吞噬完外界能量-物质后，而发射**霍金辐射量子**m_{ss}不停地收缩时，黑洞将减少R_b和M_b，**增大**T_b**和**m_{ss}，直到最后收缩成为最小黑洞M_{bm}，而且,，$M_{bm} = m_{ss} = (hC/8\pi G)^{1/2} \equiv m_p$, 并立即在普朗克领域爆炸消失。

2*. 从下面推导出的公式(2l) 可知, 黑洞的一个基本属性就是：一旦黑洞形成，不管它是在吞噬外界能量-物质而膨胀，还是因发射**霍金辐射而收缩，**直到最后收缩成为最小黑洞M_{bm}之前，它都永远是一个黑洞。从上面的公式(2c)，

$2G M_b = C^2 R_b$ (2c)

$2GdM_b = C^2 dR_b$ (2j)

假设有另外一个黑洞—M_{ba} 与 M_b合并或者碰撞，该黑洞，

$2G M_{ba} = C^2 R_{ba}$ (2k)

公式 (2j) + (2k) + (2c), 于是,

$2G(M_b + dM_b + M_{ba}) = C^2(R_b + dR_b + R_{ba})$ (2l)

3*. 等于普朗克粒子m_p 的最小黑洞$M_{bm} \equiv m_p$ 必然在普朗克领域爆炸消失的原因，

由于在 $M_{bm} < (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times10^{-5}g$ 时, $m_{ss} < 1.09\times10^{-5}g$, 所以, $m_{ss}M_b < hC/8\pi G < 1.187\times10^{-10}g^2$, 这违反了一般的黑洞公式 (2d), 不能以黑洞形式存在，只能爆炸消失。

再按照量子力学的测不准原理,

$\Delta E \times \Delta t \approx h/2\pi$ (2m)

对于最小黑洞M_{bm}, $\Delta E = M_{bm}C^2 = \kappa T_b = 10^{16}$erg,

Δt = Compton 时间 = $R_{bm}/C = 1.61\times10^{-33}/3\times10^{10} = 0.537\times10^{-43}$.

$\Delta E \times \Delta t = 10^{16}\times0.537\times10^{-43} = 0.537\times10^{-27}$, but $h/2\pi = 6.63\times10^{-27}/2\pi = 1.06\times10^{-27}$,

显然, $\Delta E \times \Delta t < h/2\pi$, 就是说，如果$M_{bm} \equiv m_p$继续存在，或者变小后还存在，它就必然也违反测不准原理。所以，$M_{bm} \equiv m_p$ 只能在普朗克领域爆炸消失。

【3】. 从前辈宇宙的“大塌陷”到现今宇宙的诞生的大膨胀的转变条件；根据时间对称原理，假设前辈宇宙的最后塌缩遵循我们宇宙新生时同样的膨胀规律。

如果将前辈宇宙的最后的“大塌缩”简单地假设成为我们宇宙诞生前的时间镜像反演或时间对称，即假设将用于描述我们宇宙诞生后的演化公式(1a)也可以反向地用于描述前辈宇宙最后的塌缩演化规律，而塌缩后演化的结果，根据计算如果符合现在宇宙各种规律和演变实况的数据的话，那么，这种假设就是合乎逻辑和规律的，就应当是合理可靠而予以承认的。

从公式(1a) $R = k_2 t^{1/2}$和(2a)，(2b)可知，当前辈宇宙走向大塌陷收缩其尺寸R时，相应地其粒子温度T增加，时间t缩小很快。在大塌陷收缩过程中(反向参看上面图一)，当t缩小 1,000 倍时，R只缩小 30 倍，所以t比R收缩得更快，这样收缩的结果，总会出现一种极限情况，当t收缩到某种极限时间时，两个相邻的粒子传递其引力所需的时间小于各个粒子湮灭解体时间，使它们中心间的真实距离d_m会变得等于当时两相邻粒子的史瓦西半径之和 2r。这时，所有相邻之间的粒子都会因为引力无时间到达而产生引力断链，而所有在整个“宇宙包”里的粒子都成为等于普朗克粒子的最小黑洞$M_{bm} = m_p$。它们之间因无引力而只能在$T \approx 10^{32}$K高温下，使前辈宇宙停止收缩而爆炸解体，从而造成前辈宇宙的消亡。同时造成宇宙的膨胀和温度密度的下降。膨胀的结果,一方面使“宇宙包”内的温度和密度随着少许的下降，而使分散的能量重新集结转换为较大一点的稳定的新的最小黑洞--$2M_{bm}$。正是在宇宙包内各处的这些新产生的最小黑洞成为产生我们新宇宙的胚胎。它们恢复引力后的合并和碰撞形成了宇宙初始的“原初暴胀”和宇宙的诞生。这就是前辈宇宙“大塌缩”到普朗克领域解体后，又生成新最小黑洞而形成我们新宇宙的转变过程。

前辈宇宙从最后的“大塌陷”转变到现今宇宙最初的“大膨胀”发生的条件，按照上述的原理由以下公式（3）来表述，

d_m--两相邻粒子间的实际距离，m –前辈宇宙塌缩到最后的粒子质量，r—粒子m的半径，t —宇宙粒子的光从中心传递到其视界半径的特征时间, C—光速, ρ—粒子m的能量-物质密度， H—哈勃常数，

$d_m \geq C\times[2t]$, 即$d_m/2C \geq t$, $-t \leq -d_m/2C$, $t = r/C$ (3)

令 ρ = 能量密度g/cm^3, $M = 4\pi\rho R^3/3$, (3aa)

H = 哈勃常数，宇宙在同一时间的常数， $H = V/R = 1/t$,

从 $4\pi\rho r^3/3 = m$, $m = \kappa T/C^2$, [<3>] (2b)

$\therefore t^3 \leq 3\kappa T/4\pi\rho C^5$ (3a)

由$\rho = 3H^2/8\pi G = 3/(8\pi G t^2)$, [<3>] (3ba)

$\therefore t \leq T(2G\kappa)/(C^5)$, (3b)

从(1a), $Tt^{1/2} = k_1$ (3ca)

$\therefore t^{3/2} \leq k_1 (2G\kappa)/C^5$或者$t \leq [k_1 (2G\kappa)/C^5]^{2/3}$ (3c)

公式 (3a),(3b),(3c)都是从公式（3）推导出来的，所以三式中的 t 是等值的。

现求t值如下：先从上面的图一中选取一对t, T 值代入(1a)求k_1, 当 取$t = 10^{-43}$ s，图中下面对应的温度$T = 10^{32}$K，如是，

$k_1 = Tt^{1/2} = 10^{32}\times10^{-43}s = 3^{1/2}\times10^{10} \approx 1.732\times10^{10}$,从公式 (3c),

$t^{3/2} \leq [(2G\kappa)/(C^5)]\times k_1 = 1.732\times10^{10}[(2G\kappa)/(C^5$, (3cb)

$G = 6.67\times10^{-8}cm^3/gs^2$, $C = 3\times10^{10}cm/s$, $\kappa = 1.38\times10^{-16}gcm/s^2K$,,

$t^{3/2} \leq [(2\times6.67\times10^{-8}\times1.38\times10^{-16}) / (3\times10^{10})^5] \times 1.732\times10^{10})] = 0.075758\times10^{-74}\times1.732\times10^{10} \approx 0.1312\times10^{-64}$,

$t^3 = 0.017217\times10^{-128} = 0.17217\times10^{-129}$, 为计算方便，下面令$t = t_m$,

$t_m = 0.5563\times10^{-43}s$, (3d)

$\therefore t_m \leq 0.5563\times10^{-43}s$, and $t_m \geq 0.5563\times(-10^{-43})$ s, (3d)

可见，t 与 t_m即是粒子与整个前辈宇宙同时解体的时间。相对应地：

$T_m = k_1/t^{1/2} = 1.732\times10^{10}/(0.5563\times10^{-43})^{1/2} = 0.734\times10^{32}K$, (3e)

m_m –与 0.734×10^{32}K相对应粒子质量：

$m_m = \kappa T/C^2 = 1.38\times10^{-16}\times0.734\times10^{32}/(9\times10^{20}) = 1.125\times10^{-5}g$, (3f)

$\rho = 3/(8\pi Gt^2) = 0.5786\times10^{93}g/cm^3$, (3g)

从公式(3aa)， m_m 的半径 r_m ，

$r_m = (3m/4\pi\rho)^{1/3} = 1.67\times10^{-33}cm$, (3h)

$d_m = C\times[2t] = 3.34\times10^{-33}cm$, $d_m \geq 2r_m$ $(=3.34\times10^{-33}cm)$ (3i)

$\therefore (d_m \geq 2r_m)$ (3j)

(3j) 表明前辈宇宙塌缩到m_m时，2 邻近粒子之间的引力却是断链了。粒子m_m爆炸解体后，由粒子 m_m组成“宇宙包” 里的密度ρ_u，

$$\rho_u = m_m / d_m^3 = 0.302\times10^{93}\text{g/cm}^3 \quad (3k)$$

由于$\rho_u < \rho$，表明前宇宙解体后，整个“宇宙包” 里的密度由于粒子爆炸后填满了空隙而降低了。n_m 表明“宇宙包” 里的m_m就是一个整体的一堆内外都无引力的能量，所以只能爆炸解体。

$$m_m C^2 = 1.125\times10^{-5}\times9\times10^{20} = 1.013\times10^{16}, \text{ 同时，} \quad \kappa T = 1.38\times10^{-16}\times0.734\times10^{32} = 1.013\times10^{16}$$

$$\therefore n_m = m_m C^2/\kappa T = 1 \quad (3l)$$

结论：计算值$t \le 0.5563\times10^{-43}$s, $T = 0.734\times10^{32}$K几乎精确地符合附录A图一中（Plank’s Era）普郎克时期末端值。对于时间反转的前辈宇宙来说，就是塌缩到进入普郎克时期的开始端。上述计算值表示前辈宇宙一旦收缩到大塌陷的$t = t_m = -0.5563\times10^{-43}$s，$T = T_m = 0.734\times10^{32}$K时，整个“宇宙包”内的粒子都塌缩成为一个个单独的内外都无引力联系的宇宙的最高能量粒子，进入普朗克领域，即$m_m = m_p = M_{bm} = 1.09\times10^{-5}$g（见下节）。无引力就无收缩的动力。所有粒子和整个“前辈宇宙”只能在普朗克领域爆炸消失。根本不可能再继续塌缩成为“奇点”。

在上述设想中,宇宙从前辈宇宙收缩坍陷到新宇宙的产生和膨胀的转变过程中,也会出现t = 0 的点，但这并非人们所认知的 “奇点”，而只是前辈宇宙从收缩坍陷点 (-10^{-43}s, R)到新宇宙膨胀起始点($+10^{-43}$s, R)之间的过渡桥梁，因为，在t = 0 点，宇宙尺寸R≠0，温度T≈10^{32}K，而不是无限大，宇宙密度ρ_u不是无限大，而是 = 3×10^{92}g/cm^3。这种观点使宇宙演化合乎能量守恒、合乎因果律(热力学第二定律)、不违反现存的各种天体物理定律与经典理论，反而是它们之间的无缝结合。

由于无数粒子m_m聚集所形成的”宇宙包”，并非自由空间，前辈宇宙无数最小黑洞m_m的爆炸解体湮灭是在密闭的宇”宙包内”完成。它们在普朗克领域同时的爆炸解体可以称之为诞生我们宇宙的“大爆炸”。其结果就是使“宇宙包”内的温度和密度降低，使分散的能量能够重新结合成稍大而稳定的最小黑洞-- $2M_{bm}$。它们就是产生我们新宇宙的胚胎。它们的长大和合并就造成了我们新宇宙的诞生和膨胀。

【4】. 最小引力（史瓦西）黑洞-- M_{bm}与普朗克粒子m_p和上节所提出的前辈宇宙的最终塌缩粒子m_m完全是同一种东西，这说明霍金黑洞理论与量子引力论和近代粒子理论等有殊途同归的互恰性。下面的公式 (4a) , (4b), (4c) 和 (4d) 来源于前面的(2f), (2g), (2h) 和 (2i) 。[1]

$$m_{ss} = M_{bm} = (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times10^{-5}\text{g.} \quad (4a)$$

$$R_{bm} \equiv L_p^{[3]} \equiv (Gh/2\pi C^3)^{1/2} \equiv 1.61\times10^{-33}\text{cm} \quad (4b)$$

$$T_{bm} \equiv T_p^{[3]} \equiv 0.71\times10^{32}\text{k} \quad (4c)$$

$$R_{bm} m_{ss} = h/(4\pi C) \quad (4d)$$

比较 M_{bm}, m_p 和 m_m的数值列在下面的表1 中。 m_m 是前辈宇宙塌缩到最后失去引力状态时的计算数值， M_{bm} **是最小黑洞**。m_p是普朗克粒子，[1]

表： M_{bm}, m_p 和 m_m的各种参数的比较

m_m无引力状态	M_{bm}–最小黑洞	m_p–普朗克粒子[3]
$m_m = 1.125\times10^{-5}$g	$M_{bm} = 1.09\times10^{-5}$g	$m_p = 1.09\times10^{-5}$g,
$t_m = \pm0.5563\times10^{-43}$s	$t_{bm} = 0.539\times10^{-43}$s	$t_p = 0.539\times10^{-43}$s,
$T_m = 0.734\times10^{32}$k	$T_{bm} = 0.71\times10^{32}$k	$T_p = 0.71\times10^{32}$k,
$r_m = d_m/2 = 1.67\times10^{-33}$cm	$R_{bm} = 1.61\times10^{-33}$cm	$L_p = 1.61\times10^{-33}$cm,

从上面的表 1, 可见，M_{bm} 和 m_p是完全等同的。[1] 但是 m_m 的数值与M_{bm} 和 m_p有一点小的误差，原因在于 m_m 来自公式(3f), 但在推导(3f)的过程中，由于时间 t 和温度 T 的数值均取自于不精确的图 1。所以, 实际上，m_m，M_{bm}和m_p三者应该是相等的。也就是说，m_m就是最小黑洞M_{bm}。**m_m所有的参数都应该等于相应的M_{bm}的参数**。所以有,

$$m_m \equiv M_{bm} \equiv (hC/8\pi G)^{1/2} \equiv m_p \quad (4e)$$

由此可见，(4e)式表明，前辈宇宙最后塌缩成为m_m时，即成为$m_m = M_{bm} \equiv m_p$，而只能爆炸解体消失在普朗克领域。[1]

【5】. 在前辈消失在普朗克领域之后，我们的新宇宙是如何从普朗克领域诞生出来的？

从公式 (4e)可见,一旦前辈宇宙最后塌缩成为m_m而进入普朗克领域时，所以在“宇宙包”里的粒子 $m_m = M_{bm} \equiv m_p$, 而立即在普朗克领域爆炸消失. 如果说，有人喜欢将我们宇宙的诞生说成是来自于一次“大爆炸”的话，那么，这所有m_m在普朗克领域的爆炸就是诞生我们新宇宙的大爆炸。因为构成我们宇宙所有的能量-物质都是来自前辈宇宙爆炸后的遗物。所以说，没有前辈宇宙的死亡，就没有能量-物质成为我们宇宙的物质基础。

我们新宇宙是如何从旧宇宙的废墟中诞生的呢？关键问题在于从旧宇宙解体的废旧能量-物质能够重新集结成为新的最小引力（史瓦西）黑洞-- M_{bm}. 其实，在 10^{32}k 和密度 10^{93}g/cm^{3}的普朗克领域本来就是能量与粒子随时都在湮灭和产生的互相转换的。我们知道它们湮灭和产生的时间就是康普顿时间，即Compton time. 因此，只有当新生粒子的寿命τ_b大于康普顿时间t_{bc}时，该粒子才能存活下来，而成为稳定的小黑洞。前面【2】节中已经论证过，黑洞一旦形成，除最后变为普朗克粒子m_p而爆炸消失外，它将永远是一个黑洞。按照霍金的黑洞寿命公式，黑洞寿命τ_b，

$$\tau_b = 10^{-27} M_b^3 \text{ (s)} \qquad (5a)$$

$$t_{bc} = R_b/C \qquad (5b) = 0.45\times10^{32}\text{k},$$

因此，只有在$\tau_b > t_{bc}$ 时，即$10^{-27} M_b^3 > R_b/C$时，新产生的黑洞M_b 才能存活，并吞噬外界能量-物质而不断地长大，从 (2c)使，得出,

$$M_b = M_{bmn} = 2.2\times10^{-5}\text{g} \ (\approx 2\, M_{bm}) \qquad (5c)$$

$$T_b = (C^3/4GM_b)\times(h/2\pi\kappa) \approx 10^{27}/M_b = 0.45\times10^{32}\text{k}, \quad (5d)$$

从 (5c)式可以看出 ，只有当形成黑小洞$M_{bmn} \geq 2.2\times10^{-5}\text{g} \approx 2M_{bm}$时，如果它的外面有能量-物质可供吞噬，$M_{bmn}$就会不停地长大成为大黑洞。在前节已经说过，由于前辈宇宙的最小黑洞$M_{bm} = m_m$的爆炸消失，使“宇宙包”内的温度密度降低，从（5d）**式可知，当**M_{bm}增加到 2 $M_{bm}=M_{bmn}$时，10^{32}k高温相应的减半即可。所以M_{bmn}是很容易而必然形成的。1*. M_{bmn} 可以由 2 个或更多个$M_{bm} = 1.09\times10^{-5}$g 碰撞结合而成，因为温度降低后的$M_{bm}$会较难解体。 2*. 从(2a) **可知，温度降低后容易形成较大的新最小黑洞**$M_{bmn} \approx 2\, M_{bm}$。 3*。小于$M_{bmn}$的高密度 10^{93}g/cm^3 粒子容易吸收外面的能量-物质，长大后塌缩成M_{bmn}, 正如中子星能吸收外界物质后，而塌缩成为黑洞的道理是一样的。 4*. 质量大于 M_{bmn} 而密度较低的粒子团容易收缩成为**新最小黑洞**M_{bmn}。一旦M_{bmn}形成之后，它们就会吸收外界密度为 10^{93}g/cm^3 的能量-物质和互相合并而不停地长大。 M_{bmn} 就成为我们新生的宇宙的胚胎，他们的合并和互相连接在一起，造成了宇宙的“原初暴涨”. 这就是我们宇宙诞生的机理和过程。“原初暴涨”后，形成较大的小黑洞。它们继续合并造成的膨胀就形成了我们现在有 137 亿年的膨胀的宇宙。

结论：我们宇宙诞生的 2个 必要条件和过程是：1。前辈宇宙及其旧的最小黑洞$M_{bm} = m_p = 1.09\times10^{-5}$g的消失为我们宇宙提供了能量-物质基础。 2 。前辈宇宙及其旧的最小黑洞$M_{bm} = m_p$的爆炸使“宇宙包”里的温度降低，而能够产生较大的较长寿命的稳定的新最小黑洞M_{bmn} 成为产生新宇宙的胚胎。没有$M_{bmn} = 2.2\times10^{-5}$g 作为胚胎，就不可能有我们现在的巨无霸宇宙，因为只有黑洞才能吞噬外界的能量-物质而长大，并能不让它们流失出去。

【6】。完全论证我们现在宇宙是一个质量为10^{56}g的真正的巨无霸宇宙黑洞（UBH）。我们宇宙的膨胀就是大量的最小黑洞 $M_{bm} \sim M_{bmn}$ **在宇宙初期合并产生膨胀的结果。Hubble定律就是我们宇宙吞噬外界能量-物质而膨胀的规律。**宇宙的平直性($\Omega = \rho_r/\rho_o \approx 1$)是宇宙黑洞的本性。

1*. 现代精密的各种天文望远镜实际的观测数据表明，我们宇宙球体具有精密而可靠的数据。 A, 我们宇宙真实可靠的年龄 $A_u = 137$ 亿年.[8] 于是，由此计算出，其视界半径$R_u = C\times A_u = 1.3\times10^{28}$ cm, 密度 $\rho_u = 3/(8\pi G A_u^2) = 0.958\times10^{-29}$ g/cm^3. 所以，宇宙的总质量 $M_u = 8.8\times10^{55}$g. B. Hubble 常数的实际的可靠的观测数值是 $H_o = (0.73\pm0.05)\times100\text{kms}^{-1}\text{Mpc}^{-1}$ [9], 由此算出宇宙的实际密度 $\rho_r = 3H_o^2/(8\pi G) \approx 10^{-29}$g/cm^3. 并得出宇宙年龄 $A_r^2 = 3/(8\pi G\,\rho_r)$, $\therefore A_r = 0.423\times10^{18}\text{s} = (134\pm6.7)$ 亿年。.结果，宇宙的总质量$M_r = 8.6\times10^{55}$g。

由此可见，两种不同的精确测量数据所得出的结果几乎完全一致。因此，取我们宇宙的数据如下作为后面的计算。 取宇宙总质量 $M_u = 8.8\times10^{55}$g. 宇宙年龄$A_u = 137$ 亿年. 视界半径$R_u = 1.3\times10^{28}$cm, 宇宙密度 $\rho_u = 0.958\times10^{-29}$g/cm^3.

2*.假如我们现在宇宙是一个真实的巨无霸宇宙黑洞 (UBH), 它就必然来自大量宇宙最小黑洞 $M_{bmn} \sim M_{bm}$的合并。为计算方便，现仍取$M_{bm} \equiv m_p = 1.09\times10^{-5}$g, 其 $R_{bm} = 1.61\times10^{-33}$cm, 其$T_{bm} = 0.71\times10^{32}$k, 其

霍金辐射量子 $m_{ss}=1.09\times10^{-5}$g. 令 N_{bu} 是 M_u 拥有 M_{bm}的数目。当然如果取M_{bmn}作为计算，结果与取M_{bm}**是一样的。因为**$M_{bmn}\approx 2M_{bm}$。

$$N_{bu}=M_u/M_{bm}=8.8\times10^{55}/1.09\times10^{-5}=8.0734\times10^{60} \quad (6d)$$

假如我们宇宙是一个由 N_{bu} 个 M_{bm} 合并而成的宇宙黑洞，那么，宇宙的R_u也应该准确地是R_{bm} 的 $N_{bu}=8\times10^{60}$ 倍。计算结果如下：

$$N_{bu}=R_u/R_{bm}=1.3\times10^{28}/1.61\times10^{-33}=8.075\times10^{60} \quad (6e)$$

由于 (6d) = (6e), 这很清楚地证明，我们宇宙M_u确实是由 N_{bu}个最小黑洞M_{bm}, 合并膨胀而成的宇宙黑洞。

3*. 宇宙膨胀的 Hubble 定律就是宇宙黑洞吞噬外界能量-物质而膨胀的规律。

将 Hubble 定律运用到我们宇宙球体的视界，

$$M_u=4\pi\rho_o R_u^3/3=4\pi(3H_0^2/8\pi G)C^3t_u^3/3=4\pi(3H_0^2/8\pi G)C^3t_u/3H_0^2=C^3t_u/2G=C^2R_u/2G \quad (6a)$$

从史瓦西对广义相对论方程的特价，公式 (2c), $2GM_b=C^2R_b$

$$M_b=R_bC^2/2G=C^3t_{bu}/2G=R_{bu}C^2/2G \quad (6b)$$

现在由于 $t_u=t_{bu}$, $R_{bu}=R_u$, $M_u=M_b$. (6a) = (6b). 而我们宇宙是一个真正的宇宙黑洞，黑洞只有在吞噬外界能量-物质或者与其它黑洞合并才产生膨胀。因此Hubble 定律所反应的宇宙质量随时间的增长而正比例增长的规律，正是黑洞吞噬外界能量-物质的膨胀规律。什么时候$t_u\neq t_{bu}$? 一旦黑洞吞噬完外界能量-物质，黑洞就会停止膨胀，此时t_{bu}就几乎不变，Hubble 定律也就失效了。宇宙年龄$t_u\neq$黑洞的Compton 时间t_{bu}.

4*. 关于我们宇宙的"平直性"问题，即($\Omega=\rho_r/\rho_o\approx1$)问题。黑洞的平均密度$\rho_o$在确定的质量$M_b$下只有一个确定值。我们宇宙作为一个真正的宇宙黑洞就是一个密封的巨大球体，所以($\Omega=\rho_r/\rho_o=1$) 是黑洞的本性，是必然的结果。不能例外。因此，50 年来，科学家们对 ($\Omega=\rho_r/\rho_o\approx1$) 的争论是一个毫无意义的伪命题。

由于提出了错误的命题 ($\Omega=\rho_r/\rho_o\neq1$), 已经导致许多科学家提出某些错误的观念，比如最明显地是"寻找宇宙丢失的能量-物质"，其次 "零点能" 与 "暗能量"等也与此有关. 因此，从公式 (6d) 和 (6e)来看，我们宇宙黑洞 UBH 一点能量-物质也未丢失，一点也不少，当然也不多。

从现在起，如果宇宙黑洞外面没有能量-物质，宇宙黑洞就会开始发生霍金辐射而不停地收缩，直到最后收缩成为最小黑洞--M_{bm}而爆炸消失，宇宙的年龄就是约为 $\tau_b=10^{-27}M_b$ (s) $=10^{-27}(8.8\times10^{55})^3\approx10^{132}$年. 如果外面还有能量-物质，宇宙黑洞会继续吞噬外界能量-物质而扩大，只有在吞噬完所有外界能量-物质后，才会不停地发射黑洞霍金辐射而最后收缩成为M_{bm} 爆炸消失。其年龄按(5a)式计算。

【7】。作者用宇宙诞生于"最小黑洞M_{bm}的合并"原理，对宇宙"原初暴涨"的机理、过程和终结提出了最新最简单的解释和计算。认为宇宙"原初暴涨"终结的时间t_o就是宇宙M_u内所有原生最小黑洞--M_{bm}**连成一整体的宇宙时间。**

从上节可知，我们现在黑洞宇宙的总质量是$M_u=8.8\times10^{55}$g, 它来自宇宙诞生时$N_{bu}=8\times10^{60}$ 个最小黑洞 $M_{bm}\equiv m_p=1.09\times10^{-5}$的合并。因此，我们宇宙黑洞的137 亿年的膨胀就是那诸多最小黑洞合并所产生的膨胀。如果将从宇宙诞生到将原始"宇宙包"内所有组成M_u的最小黑洞$N_{bu}\times M_{bm}$**连成一整体的时间定为**t_o。由于M_{bm} 的视界半径$R_{bm}=1.61\times10^{-33}$cm，假设$M_{bm}$在诞生后需要 2 或者 3 倍的$t_{bmc}$时间 将其邻近的$N_m$ 个 M_{bm} 连接起来， t_{bmc} 就是M_{bm} 的Compton 时间, $t_{bmc}=R_{bm}/C=1.61\times10^{-33}/3\times10^{10}=5.37\times10^{-44}$s. 当光（引力）走 $2\times t_{bmc}$时，M_{bm} 所能够连接的其它的M_{bm}的数目为 N_{bm2}，

$$N_{m2}R_{bm}^3=(2R_{bm})^3,\ \therefore\ N_{m2}=8 \quad (7a)$$

(7a) 式表明，当M_{bm}的引力传递时间从t_{bmc}延长到 2 t_{bmc}时， M_{bm} 能够连接 8 个M_{bm}. 那么， M_{bm} 需要延长多少倍时间才能将所有M_u 中的 $N_{bu}=8.075\times10^{60}$ 个 M_{bm}连成一体呢?

$$N_{bu}=8.8\times10^{60}\approx10^{61}=(8^{67.5}) \quad (7b)$$

(7b) 式表明，在M_{bm}的引力走过 $(2^{67.5})$倍的 t_{bmc}后，所有的N_{bu} $(=8^{67.5}\approx10^{61})\times M_{bm}$ 就连成一体成为宇宙（M_u）的原初 "宇宙包" 了。

$$(2^{67.5})\approx(10^{20.3}),\ \text{令}\ n_{o2}=10^{20.3} \quad (7c)$$

现在以同样的方式求 N_{m3}，

$$N_{m3}R_{bm}^3=(3R_{bm})^3,\ \therefore\ N_{m3}=27 \quad (7d)$$

$N_{bu} = 8.8\times10^{60} \approx 10^{61} = (27^{42.6})$, 而 $(3^{42.6}) \approx (10^{20.3})$，令 $n_{o3} = 10^{20.3}$，

$\therefore \quad n_o = n_{o2} = n_{o3} \approx (10^{20.3})$ (7e)

由(7c)和 (7e)可知，不管t_{bmc} 以几倍的时间延长，连接整个M_u 所需的时间是一样的，即 $10^{20.3}$ 秒。但从(7a) 和 (7d)看，由于黑洞的合并必然会产生“空间膨胀”，从(2c)式可知，这种空间膨胀就产生了宇宙 的“原初暴涨”, 从(7a)看，当M_{bm}连接其它的 8 个M_{bm}时，其R_{bm} 也会增长 8 倍，即 $8 = 2^3$倍。同样在 (7d), R_{bm} 也会增长 $27 = 3^3$. 这就是说，t_{bmc} 延长到 2 t_{bmc}时，其所连接的 M_{bm} 数就不是 2^3, 而是 $(2^3)^3 = 2^9$. 同样，当时间 t_{bmc} 延长到 3 t_{bmc}, 其所连接的M_{bm}的数目应是 3^9.

下面用同样的方式求一般规律的 n_o,

令 $N_{mn} = n_o^9$, 和 $n_o = 10^x$ (7f)

但 $N_{bu} \approx 10^{61}$, $\therefore 10^{61} = 10^{9x}$ (7g)

$x_1 = 61/9 = 6.8$, $\therefore \quad n_{o1} = (10^{6.8})$ (7-1a)

（7-1a）是“暴涨”情况下t_{bmc} 延长的倍数n_{o1}。现在从(7e)式按照的原理，得出一个在没有“暴涨”情况下的x_2 和n_{o2}，可称为“正涨”。

$x_2 = 61/3 = 20.3 \quad \therefore \quad n_{o2} = 10^{20.3}$ （7-1b）

$\therefore n_{o2} = n_{o1}^3$.或者——$n_{o2} = 10^{13}\, n_{o1}$ （7-1c）

1*。公式(7-1a) 和 (7-1b)证明了将所有M_u连成一体而组成整个“宇宙包”的有 2 种方式；不管以何种方式，将所有M_{bm}连成一体为M_u所需的时间都是由M_u的值所确定的。

A.暴涨：$t_{o1} = t_{bmc}\times n_{o1} = 5.37\times10^{-44}\times10^{6.8} = 0, 2\times10^{-36}s = 2\times10^{-37}s$。 (7-2a)

B. 正涨：$t_{o2} = t_{bmc}\times n_{o2} = 5.37\times10^{-44}\times10^{20.3} = 2\times10^{-24}s$ (7-2b)

$\therefore \; t_{o2}/t_{o1} = n_{o2}/n_{o1} = 2\times10^{-24}/2\times10^{-37} = 10^{13}$ (7-2c)

由t_{o2} 和t_{o1}所能生成的小黑洞M_{bb2}和 M_{bb1}的视界半径R_{bb2}和R_{bb1}分别是：

$R_{bb1} = C\, t_{o1} = 6\times10^{-27}cm$ (7-3a)

$R_{bb2} = C\, t_{o2} = 6\times10^{-14}cm$ (7-3b)

$R_{bb2}/R_{bb1} = 10^{13} = t_{o2}/t_{o1} = n_{o2}/n_{o1} = n_{o1}^2$ (7-3c)

2*. 从(7-2a) 和 (7-2b)可知, 初生宇宙的最小黑洞M_{bm}有 2 种合并的方式使初生宇宙M_u产生大膨胀，而将M_u内所有M_{bm}连成一体。 A。暴涨：指(7-2a) 中t_{o1} 产生的“原初暴涨”，这种情况可以理解为M_{bm}在原始合并过程中，小黑洞M_{bb1}的视界半径 R_{bb1}有n_{o2}/n_{o1}倍的“暴涨”。因此，经过$t_{o1} = 2\times10^{-37}$s而终结“暴涨”后，R_{bb1}变成为$R_{bb1}\times n_{o2}/n_{o1} = R_{bb2}$。 B。正涨：指(7-2b)中$t_{o2}$所产生的$M_{bm}$正常合并而引起的大膨胀。这种膨胀在$t_{o2} = 2\times10^{-24}$s时结束。所形成的小黑洞$M_{bb2}$的视界半径$R_{bb2}$。

结论：上面A和B两种情况所达到的结果是一样的，即M_{bm}的合并结果都成为R_{bb2}的小黑洞，即$M_{bb2} = M_{bb1}$和$R_{bb2} = R_{bb1}$。只不过在“暴涨”时，M_{bb1}在$t_{o1} = 2\times10^{-37}$s时就形成了。而在“正涨”时，M_{bb2}是在$t_{o2} = 2\times10^{-24}$s时才形成的。

3*。小黑洞M_{bb1}和M_{bb2}的其它参数；已知$R_{bb2} = C\, t_{o2} = 6\times10^{-14}cm$,

$M_{bb1} = M_{bb2} = 0.675\times10^{28}$ $R_{bb2} = 4\times10^{15}$ g (7-4)

$\rho_{bb1} = \rho_{bb2} = 3M_{bb2}/(4\pi R_{bb2}^3) = 4.4\times10^{54}$ g/cm^3. (7-5)

在那时，$t_{o1} = 0{,}2\times10^{-36}$s 或者$t_{o2} = 2\times10^{-24}$s时，$M_u$的密度$\rho_{bb}$ 与M_{bb2}的 ρ_{bb2} 是一样的。M_u 在那时的视界半径R_{ub}是:

$R_{ub} = (3M_u/4\pi\rho_{bb2})^{1/3} = 2.4$ cm (7-6)

$N_{ub} = M_u/M_{bb2} = 8.8\times10^{55}/4\times10^{15} = 2.2\times10^{40}$

$N_{bbm} = M_{bb2}/M_{bm} = 4\times10^{15}/1.09\times10^{-5} = 4\times10^{20}$ (7-7)

4*。现在来探讨有“原初暴涨”的情况：按照苏宜《新天文学概论》中 12.7 节中的资料和计算,[3] 根据公式（1a）$R = k_1 t^{1/2}$, R为t时的宇宙尺寸，t为从宇宙创生起的宇宙年龄，在$t = 10^{-36}$s时，宇宙经过“暴涨”的尺寸为$R_{-36} = 3.8$ cm，此时，求出宇宙密度 $\rho_{bbb} = 3.8\times10^{53}$g/cm^3, 宇宙在$M_{bm}$时的尺寸，即$t = 5.37\times10^{-44}$时的尺寸 R_{-44}.

$R_{-36} = 1.83\times10^{25}cm\times(10^{-36}s)^{1/2}/(7\times10^5\times3.156\times10^7\, s)^{1/2} = 3.8cm$ [3] (7-8)

$\rho_{bbb} = 3M_u/(4\pi R_{-36}^3) = 3.8\times10^{53}$g/cm^3 (7-9)

$R_{-44} = (3M_u/4\pi\rho_u)^{1/3} = 10^{-13}$ cm (7-10)

$R_{-36}/R_{-44} = 3.8/10^{-13} = 3.8\times10^{13}$ (7-11)

必须指出，苏宜教授书中的宇宙“暴涨”的数据是很有代表性的。它指出，当宇宙从初始暴涨到t = 10^{-36}s时，宇宙尺寸增大 10^{13}倍，体积暴涨 10^{40}倍。

5*。结论：A。(7-8)式中提出的宇宙在 10^{-36}s时的“暴涨”尺寸是 3.8 cm，作者在(7-6)中同是在约 10^{-36}s时，宇宙的“暴涨”尺寸是 2.4 cm，二者是极其接近的。这说明作者提出宇宙“原初暴涨”的机理是：所有宇宙M_u中的原初最小黑洞M_{bm}的合并造成了宇宙的“原初暴涨”，而所有M_{bm}合并将M_u连成一体后，就是“原初暴涨”的终结。作者前所未有的对“暴涨” 发生的机理、过程和终结都做出了明确的规定和计算，其数据符合现有的理论和观测数据。 B。因为“暴涨”发生在宇宙初生时的 10^{-24}s之前，其发生的真实情况也许永远不可能被人类观测到。因此，如未来在“暴涨”被否定的情况下，作者还提出了“正涨”的机理、过程和终结的理论。就是说，只要宇宙出生于最小黑洞M_{bm}， 由M_{bm} 合并 产生的膨胀只能二者必居其一。

6*。从第 2 页的图 1, 看，$t_{bb} = 0.2\times10^{-36}$s在宇宙演变的大统一时代，即 GUT Era。

【8】. 对我们宇宙过去现在和将来的数据的一些简单的陈述.

我们现在的宇宙是一个真正的巨无霸宇宙黑洞，他的生长衰亡完全符合一般黑洞的规律。他因吞噬外界能量-物质或与其它大小黑洞合并而增加M_u和R_u，只有外界无能量-物质可吞噬时，就发射霍金辐射，直到最后收缩成为最小黑洞$M_{bm} = m_p$而消亡。这时，宇宙的年龄将是$L_u \approx 10^{132}$亿年。如果宇宙尚有能量-物质可吞噬，它们被吞噬完后，宇宙才收缩，结果同上。只不过宇宙年龄将是$L_u >> 10^{132}$亿年.

我们宇宙黑洞现在的年龄为A_u = 137 亿年。视界半径R_u = 1.3×10^{28} cm, 宇宙黑洞的总质量是$M_u = 8.8\times10^{55}$g.宇宙现在的的平均密度$\rho_u = 3/(8\pi GA_u^2) = 0.958 \times 10^{-29}$ g/cm^3. 宇宙中遍布着大小黑洞，还有大黑洞套住小黑洞。平直性 ($\Omega = \rho_r / \rho_o = 1$) 是宇宙黑洞的本性。

宇宙黑洞诞生于普朗克粒子m_p的最小黑洞M_{bm}，即$M_{bm} = m_p$。由$N_{bu} = 10^{61}$个M_{bm}合并而成，宇宙诞生时的尺寸只有现在的质子大小，即$R_{u0} = 10^{-13}$cm. M_{bm}在出生时的合并造成了宇宙的“原初暴涨”，宇宙在$t_o = 2\times10^{-37}$s时结束“原初暴涨”，将整个M_u连成一体, 并形成许多$M_{bbl} = 4\times10^{15}$ g的小黑洞。宇宙黑洞现在的膨胀就是这些小黑洞M_{bbl}的合并造成的。

人类现在生活在宇宙黑洞中，不知道宇宙黑洞M_u视界之外的宇宙，但在宇宙黑洞内的空间，散布者许多黑洞，最小的黑洞是约 $3M_\theta$的恒星级黑洞，最大的黑洞是（10^8~10^{12}）M_θ的超级大黑洞，它们都处在星团和星系的中心。

【9】. 进一步的解释、分析和结论:

1*.奇点被定义为具有无穷大密度的点。广义相对论方程中粒子的点结构、粒子没有热压力作为对抗力、零压宇宙模型和定质量物质粒子的收缩必然造成奇点的出现。就是这些假设使S•霍金 和 R• 彭罗斯在 40 年前证明了我们宇宙诞生于奇点或奇点的“大爆炸”，证明了黑洞里有奇点。本文运用霍金的黑洞理论公式和其它经典理论公式，推导出来一个新的重要公式 (3c)，$-t^{3/2} \le k_1(2G\kappa)/(C^5)$, 精确地计算出，当前辈宇宙塌缩到时间$t \approx -0.5563\times10^{-43}$s时，所有前辈宇宙中的；粒子塌缩成为最小黑洞$M_{bm} = (hC/8\pi G)^{1/2} \equiv m_p \equiv 1.09\times 10^{-5}$g, 即普朗克粒子$m_p$，而爆炸消失在普朗克领域。由于爆炸使充满能量-物质的“宇宙包”产生膨胀和温度的降低，于是能量重新聚集成稍大的稳定的最小黑洞 $2M_{bm}$ ，它们成为产生新宇宙的胚胎，他们的合并造成了宇宙的“原初暴涨” 和我们现在宇宙黑洞的膨胀。

2*. 实际上John & Gribbin已在他的<大宇宙百科全书>书中指出，”我们宇宙可能来源于 $M_{bm} \approx 10^{-5}$g的粒子”[<7>]“（普朗克领域 ）实际上是我们宇宙诞生时的状态.”[<7>] 作者在本文中只不过用正确的理论公式和数据通过精密的计算准确地证实了 John & Gribbin 的这个猜想而已。

3*. 我们宇宙是一个真实的宇宙黑洞 (UBH), 它完全遵循一般黑洞的参数M_b, R_b, T_b, m_{ss}在其视界半径R_b上的守恒公式。因吞食外界能量-物质而膨胀，发射霍金辐射而收缩。

4*. 本文首次提出了产生“原初暴涨” 的机理，并论证了我们新生宇宙的 “原初暴涨” 是由于新生的最小黑洞 M_{bm} 的合并而造成的，其终结的时间为$t_{bb} = 0.2\times10^{-36}$s.

5*. 无论我们现在的宇宙是膨胀还是收缩，或者说是开放还是封闭，不像弗里德曼对广义相对论方程的解所指出的那样，取决于宇宙的实际密度 ρ_r, 这种$\rho_r \ne \rho_c$ 或 $\Omega \ne 1$ 的假设是从错误的理论中得出的伪命

题。对于一个真正的宇宙黑洞，只有一个取决于M_b的确定密度， $\rho_r = \rho_c$ 或$\Omega = 1$ 是黑洞的本性。科学家几十年对$\rho_r \neq \rho_c$ 的争论时毫无意义的。

6*. 宇宙学中有 4 大难题，即奇点, 平直性疑难, 视界疑难和磁单极疑难，他们困扰了科学家们数十年，作者在本文中解决了奇点和平直性疑难之后，其它 2 个疑难就容易了。况且本文对“原初暴涨”的正确解决可能对视界疑难提供了解决的钥匙。

7*。本文虽未创建新理论或创立新方程,但在解答现今存在的科学难题上却似乎胜过其它的任何一种单独的经典理论或新理论. 由于所运用的各种经典理论的基本公式基础坚实,在自然界行之有效, 故文中对宇宙学提出的所有新观念新论证新解释和新结论有比较圆满的自洽性，与现今的观测数据完全相符合。本文也不排斥任何新理论的现有成果和结论.

8*。如果本文排除了宇宙诞生于 “奇点”或者 “奇点的大爆炸”，那就没有必要在宇宙创生时给于任何特殊的边界条件, 也不必乞灵于上帝或奇迹或新物理学如量子引力论，弦论或超对称理论等对我们宇宙起源或对“宇宙大爆炸”的诸多牵强附会的解释. 根据现成的经典理论就能阐明和推算出我们宇宙诞生时的演变机理, 条件和过程，这种演变过程完全符合现有的物质世界的规律和物理定律，如因果律，质能转变守恒定律，和我们现在宇宙黑洞的膨胀。

9*. 本文计算中所得出的数据与现有理论，公式和观测结果是相当一致的。这表示本文中新观念是宇宙的实际演化规律的一幅较好的自洽图像。或许本文中的新观念和论证方法由于缺乏深奥的新理论，复杂的数学方程和违反常规而难于为绝大多数科学家所接受和信服。但本文由于所用的理论和公式却是可靠而有效的，所以其独特而简单的证明方式和所计算的结果是符合宇宙演变中各种现有的规律的。这为运用几个简单而可靠的经典基本公式以解决复杂的科学难题提供了一个实例。爱因斯坦曾警告说：“万事万物应该尽量简单，而不是更简单。”本文中简单的新观念和新的论证方法也许可以作为一种抛砖引玉吧。

====全文完====

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