The Numbers Principles of Natural Philosophy

(Version 3)

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Abstract

Through the logical analysis of the numbers 0 and 1, continuously split the number 1, split to infinitesimal, a logarithmic function is established. The matter break-up and space, let their set is a logarithmic function. After the introduction of Planck length, the model of the universe is established. Conclusions are drawn from the model: Our universe opens from 1 (There is), the universe is finite, max $1/(1.6\times10^{-35})$meters. The whole process is： contraction → the origin → the universe opens → expansion → Big Rip, end. The dimension on cosmic original point space is invalid, and there is no external space. Direction and matter cannot be positive at the same time. We are opposite to the direction of the symmetrical universe. Infer: The break-up of matter produces space and expands the universe. There is a multiverse.

Key words: Logarithm, Matter, Space, Planck length, Cosmic Model, Multiverse

In 1687, Newton published *The Mathematical Principles of Natural Philosophy*, he established classical mechanics with mathematics and philosophy. This paper uses numbers and philosophy to explore the nature of the universe.

1. Logic

0 and 1 are the origin of numbers, logical analysis of 0 and 1, as a tool and can help us explore the source of things.

1.1 The number 0

$$\begin{cases} 0=0 & (1) \\ 0=0+1-1+\cdots\cdots+0+1-1 & (2) \end{cases}$$

In equation (1), 0 has not changed, it has no significance in this paper and do not discuss. We have the number 1 In equation (2).

1.2 The number 1

$$\begin{cases} 1=1 & (3) \\ 1=0-1+1+1 & (4) \\ 1=0001/0010+0001/0010=0001/0100+0001/0100+0001/0100+0001/0100 \\ \quad =\cdots\cdots=1/\infty+\cdots\cdots+1/\infty \quad \{R^{+}\} & (5) \end{cases}$$

In equation (3), 1 has not changed, Equations (3) and (4) can be substituted into equation (2) and is part, they don't significance in this paper. Equation (2) and (5) have changed and is meaningful.

1.3 The equation (5)

1.3.1 In equation (5), 1 has changed, and it changes regularly, it is meaningful.

1.3.2 Change within the range of positive real numbers. (Negative numbers are completed by "- 1").

1.3.3 The result of this number change can only be split, continuous splitting, loop down until infinitesimal.

1.4 Equations (2) and (5)

$$\begin{cases} 0=0+1-1+\cdots\cdots+0+1-1 & (2) \\ 1=0001/0010+0001/0010=0001/0100+0001/0100+0001/0100+0001/0100 \\ \quad =\cdots\cdots=1/\infty+\cdots\cdots+1/\infty \quad \{R^{+}\} & (5) \end{cases}$$

In equation(2), the number 1 is generated from 0, we have 1 that can be used; in equation(5), 1 is regularly changing, they are all meaningful.

1.4.1 Suppose there is a function y=f(x).

In equation(2), 0 = f(1); x=1, y=0, it is a necessary condition of the function.

1.4.2 Equation (5) extension

1=1/2+1/2=1/4+1/4+1/4+1/4

1=1/3+1/3+1/3=1/6+1/6+1/6+1/6+1/6+1/6

1=1/5+1/5+1/5+1/5+1/5=1/10+⋯⋯+1/10

⋯⋯⋯⋯

1/2=1/4+1/4

(1+⋯+1)+ (1/2+⋯+1/2)= (1/2+1/2+⋯+1/2+1/2)+(1/4+1/4+⋯+1/4+1/4)

=(1/4+1/4+1/4+1/4+⋯+1/4+1/4+1/4+1/4)+(1/4+1/4+⋯+1/4+1/4) (6)

1/3=1/6+1/6

(1+⋯+1)+(1/2+⋯+1/2)+(1/3+⋯+1/3)

= (1/4+⋯+1/4)+(1/6+⋯+1/6)=1/12+⋯⋯+1/12 (7)

⋯⋯⋯⋯

(1+⋯+1)+(1/2+⋯+1/2)+(1/3+⋯+1/3)+⋯⋯=1/∞+⋯⋯+1/∞ (8)

1.4.2.1 The number on the right side of the equation is constantly split, loop down to infinitesimal ($x \to 1/\infty$).

1.4.2.2 Equation(6)～(8): The smaller the value split on the right he larger the sum on the left($x \downarrow y \uparrow$); when the value of the value split on the right tends to be infinitesimal , the sum on the left tends to infinity ($x \to 1/\infty$， $y \to \infty$).

1.5 Summarize the properties of the function y=f(x).

1.5.1 Eternity passes coordinate (1, 0) , f(x) ==>(1， 0).

1.5.2 $x \to 1/\infty$, ($0 < x \leqslant 1$).

1.5.3 $x \downarrow y \uparrow$, ($x \to 1/\infty$， $y \to \infty$) , ($0 < x \leqslant 1$， $0 \leqslant y < \infty$).

1.5.4 Conclusion: It is a logarithmic function (or exponential).

1.6 which one

n(logaX), loga(X^n), X(logaX), (logaX)/X, $(\log_a X)^{1/n}$, $(\log_a X)^n$, $(n \in N^+)$

1.6.1 y = n(logaX), y = loga(X^n)

y = n(logaX) = loga(X^n)= log($a^{1/n}$)X

It's just that the base of logarithm is changing, do not change the nature of logaX.

1.6.2 y = X(logaX)

It goes through the point (0, 0), equation (1), meaningless.

1.6.3 y = (logaX)/X , $Y = (\log_a X)^{1/n}$

It is in the opposite direction in “1.4.2 Equation (5) extension”, do not adopt.

1.6.4 $y = (\log_a X)^n$

Conclusion: $y=(\log_a X)^n$ is the function we are looking for; when n=1, Y=logaX.

1.6.5 From equation (2) and (5) to logarithm function, dynamically aggregate the change of the number, from one-dimensional to two, there is a corresponding value in the vertical direction.

1.7 Analyze "- 1" in the same way, Derive out $y = -(\log_a(-X))^n$.

According to the condition of centrosymmetric $f(x) + f(-x) = 0$,

$(\log_a(X))^n + (-(\log_a(-X))^n) = (\log_a(X))^n - (\log_a(-(-X)))^n = (\log_a(X))^n - (\log_a(X))^n = 0$,

So $y = -(\log_a(-X))^n$ and $y = (\log_a X)^n$ are centrosymmetric around the origin O,

That is, the logarithmic function derived with the numbers 1 and -1 and they are centrosymmetric, the center of symmetry is the origin O. (Fig.1)

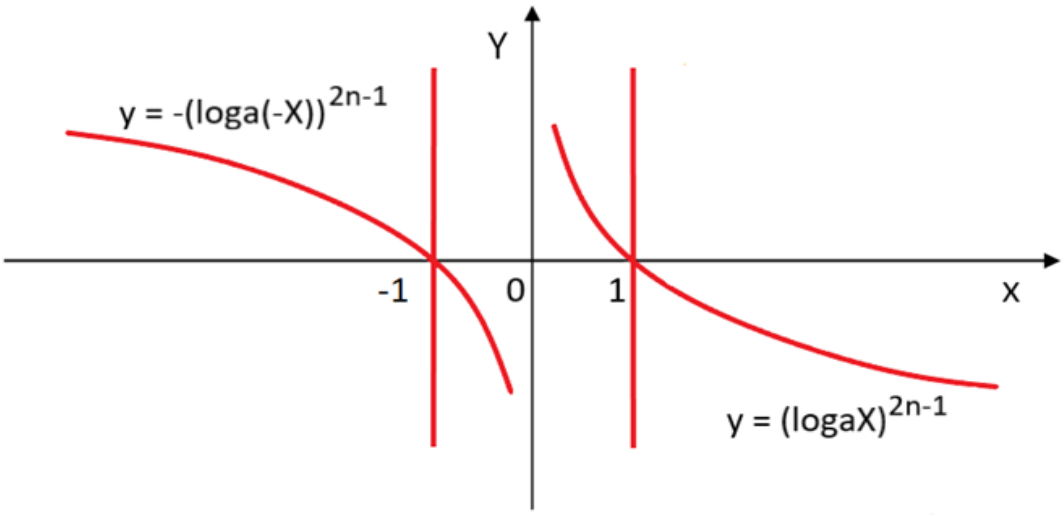
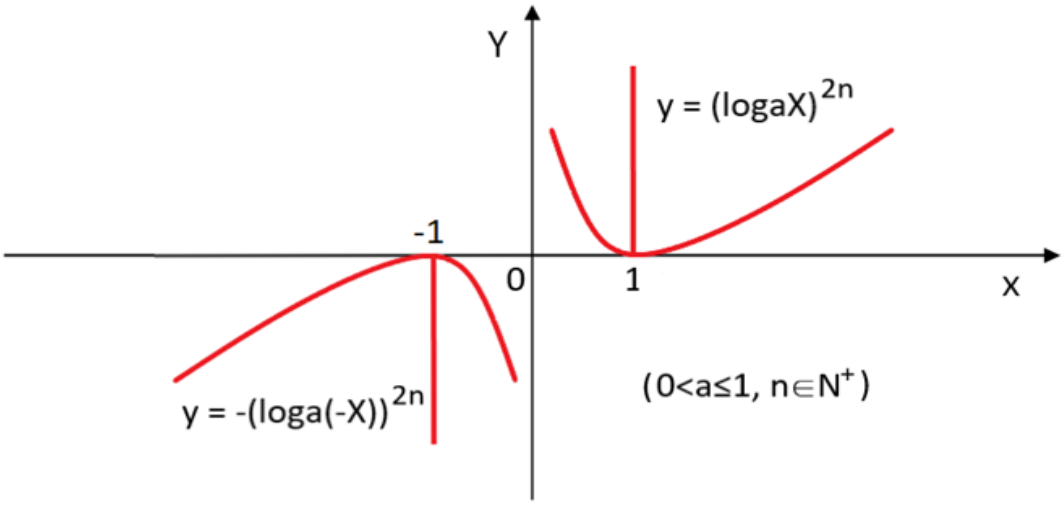


Fig.1



2. Physics

Mathematics has infinitesimal but there is a minimum in physics. When we introduce the Planck length, this function curve has physical properties. The Planck length is the minimum length, and a size smaller than it doesn't make sense（Hossenfelder 2012）.

3. Cosmic model

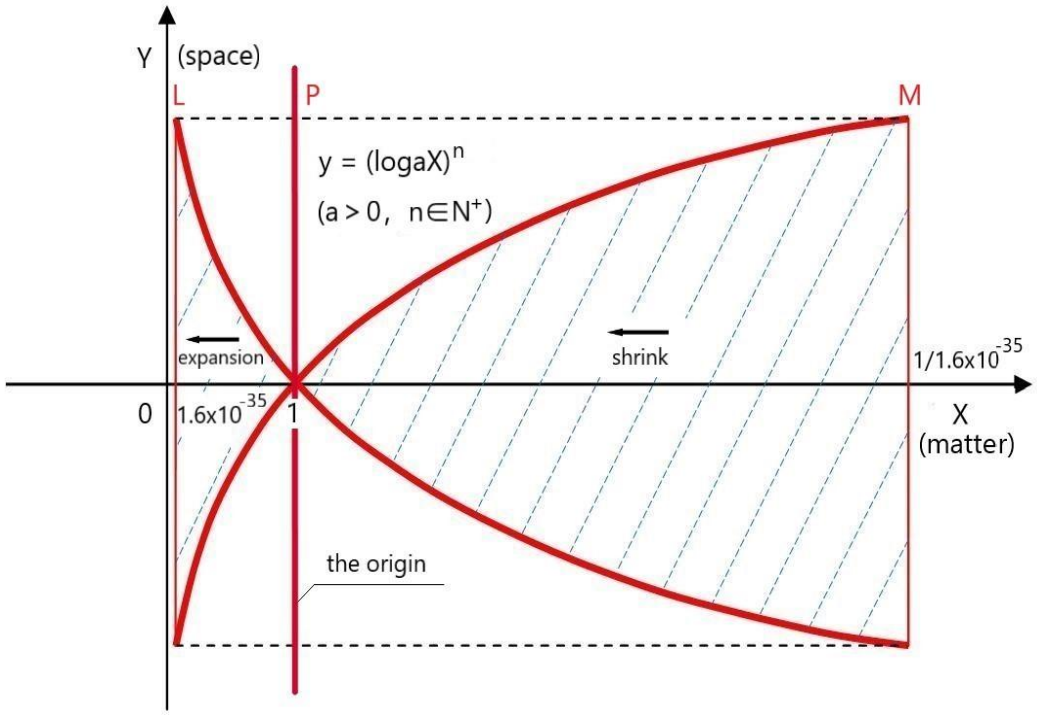


Fig.2

3.1 Let X be the matter axis and Y the spatial axis. The break-up of matter and spatial correspondence, their sets are logarithmic functions.

$Y=(\log_a X)^n$ rotates around the X axis, form a graph with a spatial volume, the ends are open. The space volume formed by $Y=(\log(1/a)X)^n$ is equal to it, they are equivalent.(equivalent to $Y = (\log(1/a)X)^n$ when n is odd, and $Y = -(\log(1/a)X)^n = -(\log_a X)^n$ when n is even.)

3.2 When we introduce the Planck length, the ends are closed. I think the universe is limited, the maximum value is $1/(1.6\times10^{-35})$ basic units, when the Planck length is introduced, its value is $1/(1.6\times10^{-35})$ meter, it is the maximum diameter of the universe[2].

The maximum diameter of the universe is: $D_{umax} = 1/\ell_P$

D_{umax} — The maximum diameter of the universe.

ℓ_P — Planck length

3.3 Figure 2 (from right to left)

The universe begins to contract from the maximum(M), gradually shrinks to the origin(P); then Big Bang, the universe expands, Big Rip, and the universe reaches its maximum(L), end(Wang 2017, pp147-148).

In theory, when matter is partition to a minimum(L) and is also the largest universe(M). At this time, the universe is flat and uniform, the density of every one cubic meter is equal, the universe is a whole and can be regarded as a huge matter.

At this time, y = $\pm 1/(2\,\ell_P)$, n = 1, a = $\ell_P^{\pm 2\,\ell^P}$

Total space-time volume of the universe:

$$V_{\sum(s\text{-}t)} = \pi \int_{\ell p}^{1/\ell p} \log^2 a \mathrm{x}\, dx \quad (a>0, a\neq 1)$$

The volume of space-time that expands to the end after the universe opens:

$$V_{b(s\text{-}t)} = \pi \int_{\ell p}^{1} \log^2 a \mathrm{x}\, dx \quad (a>0, a\neq 1)$$

Our next step is to get the measurement data, calculate our current position in space-time and the size of the universe.

3.4 Cosmic original point

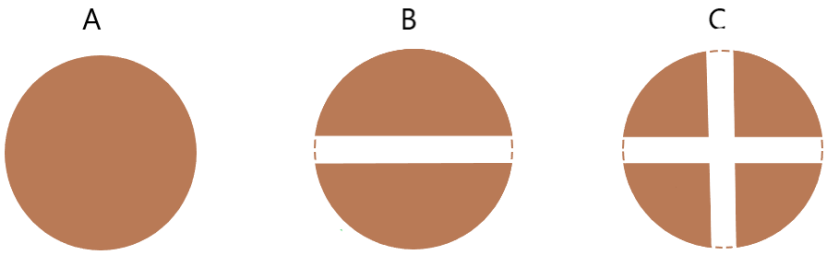
The dimension on this point space is invalid (x=1), from minus infinity to plus infinity, and there is no external space.

3.5 The 1 on the X axis should be understood as 1 basic unit, it should not be interpreted as that the cosmic original point size is 1 meter.

4. The break-up of matter produces space[3]

4.1 The break-up of volume

There is no space in cosmic original point, create space when opened. The more substances are split, the more space is created.



Three spheres, A there is no space , C space is larger than B space.

Fig.3

A, B, C three spheres, A there is no space, C space is larger than B space(Fig.3).

4.2 Radiation

Because mass–energy equivalence, energy radiation is also a kind of matter separation. The radiation is not continuous, it is emitted in waves, one by one and there is gap between them. Gaps (space) are generated by radiation waves.

4.3 When the mass of a substance decreases, it is considered that a split has taken place.

4.4 Formula

According to Einstein's mass-energy formula $E = mc^2$

Derive out: $V_w = E/\rho c^2$

V_w — Space volume

ρ — vacuum energy density, 5.96×10^{-27}kg/m^3(Planck Collaboration 2016)

$V_w = 1.87\times10^9\times E$

It is calculated that the radiated energy of 1 Joule can produce 1.87×10^9 m^3 space. This is an empirical value.

5. Hypothesis

5.1 The break-up of matter produces space; when matter releases energy, it also releases space, radiation waves cause spatial growth.

5.2 The space created by the break-up of matter expands the universe.

6. Multiverse

6.1 The paper established that the universe has boundaries. Then, there can also be matter outside the boundary.

6.2 There is initial singularity, the Big Bang opened the multiverse (equation (2)), our universe starts with the Planck length (equation (5)).

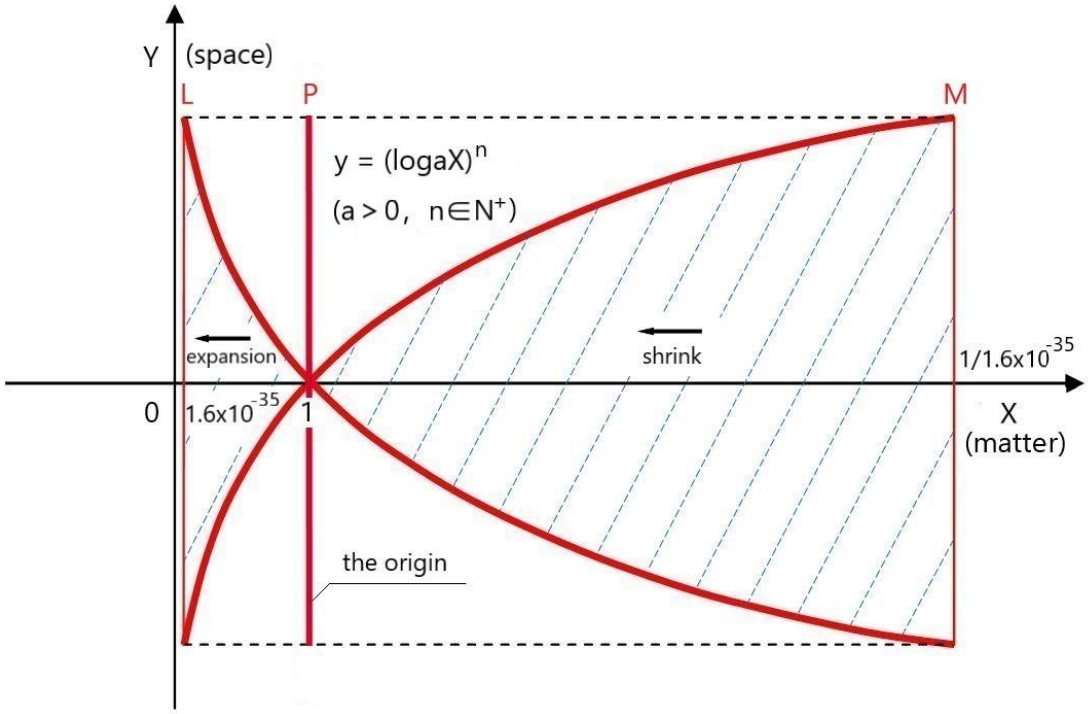
That is to say, the current Big Bang theory is a theory that forms a multiverse, we are the subuniverse, a successful universe.

6.3 The multiverse has various forms：expansion, contraction, stagnation, origin period, past, future, symmetrical universe, and so on.
6.4 Our universe ended after destruction, the next universe has nothing to do with us.
6.5 The total mass energy of the multiverse is zero, the mass and energy of a single universe is not zero, the sum of the mass and energy of the adjacent universe (including time) can be zero.

7. Discuss

7.1 Another interpretation (Fig.4)

Fig.4



The expansion of the universe is also a process of contraction, the expansion we see is also shrinking, it's contracting with respect to the original point. Expansion and contraction occur simultaneously, the universe expands to the maximum and the origin shrinks to the minimum.

The origin is not one, but countless[4], the size of each origin is not less than Planck length, the universe was opened from matter.

7.2 About dark energy

> Dark energy is thought to be very homogeneous and not very dense, and is not known to interact through any of the fundamental forces other than gravity(Wikipedia 2022).

If dark energy can gravitationally interact with galaxies, We went back to classical mechanics, it is the action of force causes a body to motion and through space, this is

contradictory to the retrogression speed of galaxies faster than the speed of light, violate the special theory of relativity.

The break-up of matter produces space, when matter releases energy, it also releases space, it's the space itself that is expanding and doesn't interact with other forces.

7.3 The preliminary theoretical formula (the release of energy creates space)

$$Vspace = E\lambda^4/hc$$

Vspace — Space volume; E — Energy; λ— Wavelength; h — Planck constant
c — Speed of light;

7.4 About 1 and 0, with and without, existence and non-existence, the relationship between them is an esoteric philosophical question. This paper thinks that they are related.

In a system where there is no time, no space, and the laws of physics fail, there are two points that can be determined: with and without; logic. Logical reasoning with 1 and 0 is an attempt.

8. Conclusion

Ⅰ. Our universe opens from 1 (There is matter) Instead of 0, "-1" is separate. We live in a world of positive matter[5].

Ⅱ. The universe is finite, maximum diameter $1/(1.6\times10^{-35})$meters.

Ⅲ. The dimension on cosmic original point space is invalid, and there is no external space.

Ⅳ. Direction(time) and matter cannot be positive at the same time. The direction (polarity) of the symmetrical universe is opposite to ours[6](Fig.1).

Ⅴ. The break-up of matter produces space and expands the universe.

VI. There is a multiverse.

Notes

1.Why constantly change? Because the universe is constantly moving, only change makes sense.

2.Compared with the maximum universe, the observable universe is equivalent to volleyball and the earth.

3.This paper agree with loop quantum gravity: space is made up of discrete blocks, there is a minimum space.

4.Same idea as Einstein.

5. Positive and negative are relative.

6.It can be verified, if unexplained particles are found, we have to think in this respect.

References

Hossenfelder.S., “Can we measure structures to a precision better than the Plan ck length?”, *Class. Quantum Gra*v., 29, 115011, (2012).

Plenck Collaboration (2016). "Planck 2015 results. XIII. Cosmological paramete rs". *Astronomy & Astrophysics*. 594: A13.(31 December, 2021 https://en.w ikipedia.org/wiki/Cosmological_constant “Cosmological constant”)

Wang, Z. *The End and Beginning of Mankind*. P147–148. (in Chinese, ISBN: 9789888437368, Red Publish, Hong Kong. 2017). https://books.google.com.hk/books?id=2HAnDgAAQBAJ&printsec=frontcover &dq=ISBN:+9789888437368&hl=zh-CN&sa=X&redir_esc=y&sourceid=cndr#v =onepage&q=ISBN%3A%209789888437368&f=false;

Wikipedia **“**Dark energy” 31 December, 2021 https://en.wikipedia.org/wiki/Dark _energy

自然哲学的数字原理

（第 3 版）

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摘 要 通过对数字 0 和 1 进行逻辑分析，对数字 1 不断地拆分，直至无穷小，建立了一个对数函数。设物质分拆与空间，它们的集合是对数函数关系。在引入普朗克长度后，建立了一个纯理论的宇宙模型。依据模型得出结论：我们的宇宙是从有物质开启，宇宙是有限的，最大直径 $1/(1.6\times10^{-35})$米。完整的过程是从收缩开始：收缩→收缩至原点→宇宙开启→膨胀→大撕裂，结束。宇宙原点空间上的尺寸失效，没有外部空间。方向和物质不能同时为正；我们与对称宇宙的方向相反。推测出：物质分拆产生空间使宇宙膨胀；存在多元宇宙。

关键词 对数，宇宙模型，物质，空间，膨胀，普朗克长度

1687 年牛顿出版了《自然哲学的数学原理》，用数学和哲学创立了经典力学。本文用数字和哲学探讨宇宙的本质。

1. 逻辑

0 和 1 是数字的本源，对 0 和 1 进行逻辑分析，作为工具，能帮助我们探索事物的源头。

1.1 数字 0

$$\begin{cases} 0=0 & (1) \\ 0=0+1-1+\cdots\cdots+0+1-1 & (2) \end{cases}$$

等式(1)中 0 没有变化，在本论文中没有意义，不讨论；等式(2)中有 1 了。

1.2 数字 1 的演变

$$\begin{cases} 1=1 & (3) \\ 1=0-1+1+1 & (4) \\ 1=0001/0010+0001/0010=0001/0100+0001/0100+0001/0100+0001/0100 \\ \quad =\cdots\cdots=1/\infty+\cdots\cdots+1/\infty \quad \{R^{+}\} & (5) \end{cases}$$

等式(3)没有变化，等式(3)和(4)可以代入等式(2)中，是(2)式中的一部分，在本文中没有意义。等式(2)和(5)有变化，是有意义的。

1.3 等式(5)。

1.3.1 等式(5)有变化，并且是有规律的变化，是有意义的。

1.3.2 在正实数范围内变化[1]（负数由-1 完成）。

1.3.3 这个数变化的结果只能是被拆分，不断的拆分，向下循环，直至 $1/\infty$。

1.4 等式(2)和(5)

$$\begin{cases} 0=0+1-1+\cdots\cdots+0+1-1 \quad (2) \\ 1=0001/0010+0001/0010=0001/0100+0001/0100+0001/0100+0001/0100 \\ \quad =\cdots\cdots=1/\infty+\cdots\cdots+1/\infty \quad \{R^{+}\} \quad (5) \end{cases}$$

等式(2)中，从 0 中产生了 1，我们有 1 可以用了；等式(5)中，1 有规律的不断变化，它们都是有意义的。

1.4.1 设有函数 y = f(x)

等式(2)中 0 = f(1)；x=1，y=0，它是函数的必要条件。

1.4.2 等式(5)扩展

$$\begin{cases} 1=1/2+1/2=1/4+1/4+1/4+1/4 \\ 1=1/3+1/3+1/3=1/6+1/6+1/6+1/6+1/6+1/6 \\ 1=1/5+1/5+1/5+1/5+1/5=1/10+\cdots\cdots+1/10 \\ \cdots\cdots\cdots\cdots \\ \downarrow \\ 1/2=1/4+1/4 \\ (1+\cdots+1)+(1/2+\cdots+1/2)=(1/2+1/2+\cdots+1/2+1/2)+(1/4+1/4+\cdots+1/4+1/4) \\ \quad =(1/4+1/4+1/4+1/4+\cdots+1/4+1/4+1/4+1/4)+(1/4+1/4+\cdots+1/4+1/4) \quad (6) \\ 1/3=1/6+1/6 \\ \downarrow \\ (1+\cdots+1)+(1/2+\cdots+1/2)+(1/3+\cdots+1/3) \\ \quad =(1/4+\cdots+1/4)+(1/6+\cdots+1/6)=1/12+\cdots\cdots+1/12 \quad (7) \\ \cdots\cdots\cdots\cdots \\ (1+\cdots+1)+(1/2+\cdots+1/2)+(1/3+\cdots+1/3)+\cdots\cdots=1/\infty+\cdots\cdots+1/\infty \quad (8) \end{cases}$$

1.4.2.1 等式右边的数不断分拆，向下循环，直至 1/∞。

1.4.2.2 等式(6)～(8)：右边拆分的数值越小，左边的和值数越大 (x↓ y↑)；右边拆分的数值趋向于无穷小时，左边和值趋向于无穷大(x→1/∞，y→∞)。

1.5 总结函数 y=f(x)的性质

1.5.1 恒经过坐标（1，0），f(x) ==>(1，0)。

1.5.2 $x \to 1/\infty$ $(0<x\leqslant 1)$。

1.5.3 $x \downarrow y \uparrow$，$(x \to 1/\infty，y \to \infty)$，$(0<x\leqslant 1，0\leqslant y<\infty)$。

1.5.4 结论：它是一个对数函数（或指数函数）。

1.6 确定对数函数

$n(\log_a X)$, $\log_a(X^n)$, $X(\log_a X)$, $(\log_a X)/X$, $(\log_a X)^{1/n}$, $(\log_a X)^n$, $(n \in N^+)$

1.6.1 $y = n(\log_a X)$, $Y = \log_a(X^n)$

$y = n(\log_a X) = \log_a(X^n) = \log(a^{1/n})X$

只是对数的底数在变化,不改变 $\log_a X$ 的性质。

1.6.2 $y = X(\log_a X)$

它通过坐标(0,0)点，无意义(等式(1))。

1.6.3 $y = (\log_a X)/X$, $Y = (\log_a X)^{1/n}$

它在“1.4.2 等式(5)扩展”中是逆方向，不采用。

1.6.4 $y = (\log_a X)^n$

结论：$y = (\log_a X)^n$ 是我们要找的函数；当 $n = 1$ 时，$Y = \log_a X$。

1.6.5 从等式(2)和(5)到对数函数，动态集合了数的变化，从一维到二维，有了垂直方向的对应值。

1.7 用同样的方法分析”-1”，推导出 $y = -(\log_a(-X))^n$；

根据中心对称的条件 $f(x) + f(-x) = 0$。

$(\log_a(X))^n + (-(\log_a(-X))^n) = (\log_a(X))^n - (\log_a(-(-X)))^n = (\log_a(X))^n - (\log_a(X))^n = 0$,

所以 $y = -(\log_a(-X))^n$ 与 $Y = (\log_a X)^n$ 是以原点 O 为中心对称。

即:用数字 1 和-1 推导出的对数函数，它们中心对称，对称中心是原点 O。（图 1）

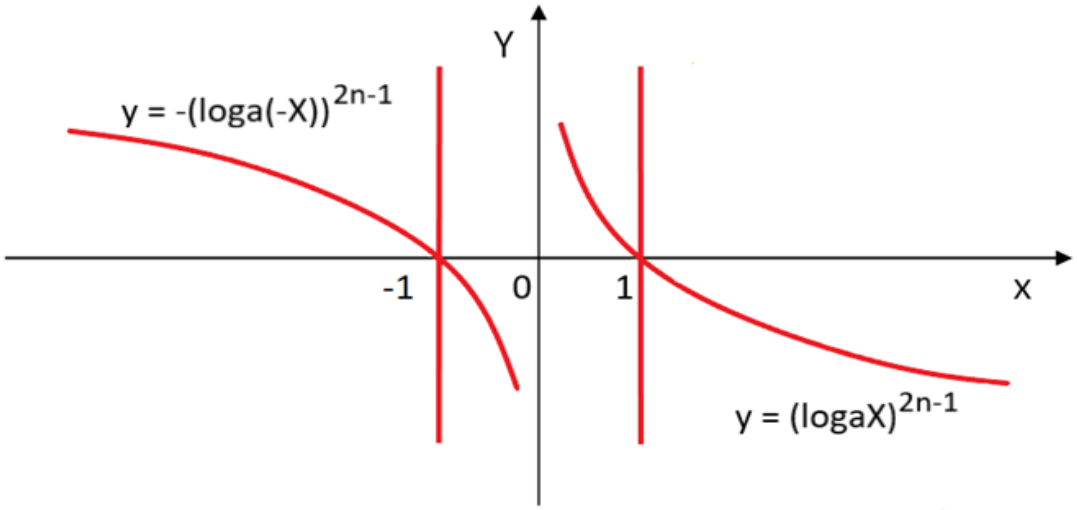
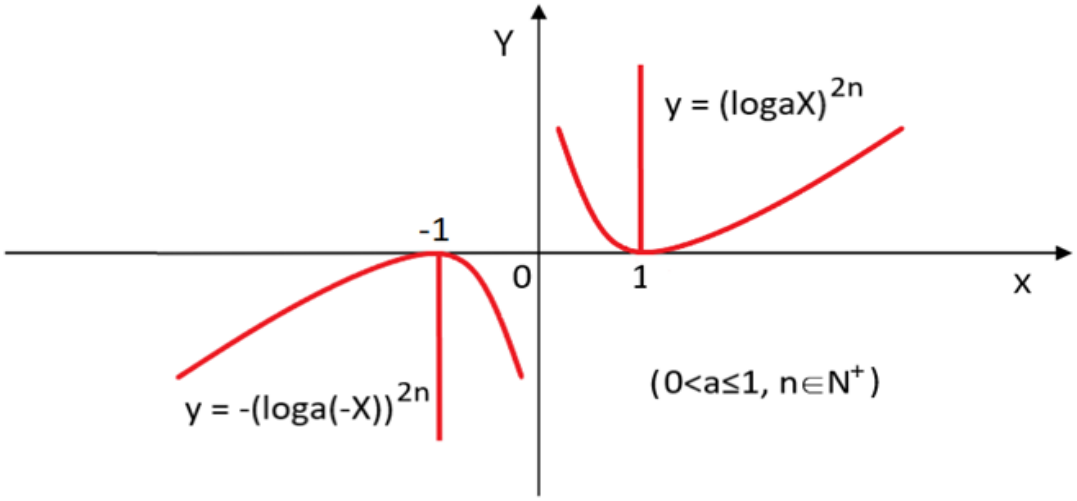


Fig.1



2. 物理

数学有无穷小，但是进入物理学就有最小值了。当我们引入普朗克长度后，这项函数曲线就具有物理性质了。普朗克长度是最小长度，比其更短的长度是没有意义的（Hossenfelder 2012）。

3. 宇宙模型

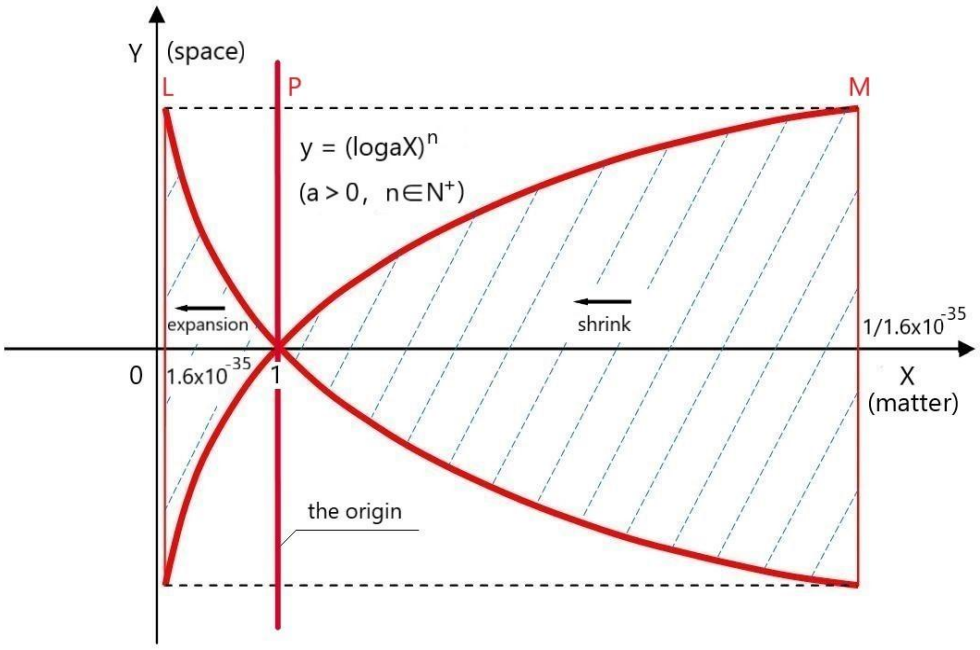


图 2

3.1 设 X 为物质轴，Y 为空间轴。物质的拆分与空间对应，其集合是对数函数关系。$Y=(\log aX)^n$ 绕 X 轴旋转，形成一个有空间体积的图形，两端是开放的，$Y=(\log(1/a)X)^n$ 形成的空间体积与其相等，它们等效。(n 为奇数时与 $Y=(\log(1/a)X)^n$ 等效，n 为偶数时与 $Y=-(\log(1/a)X)^n=-(\log aX)^n$ 等效)

3.2 当我们引入普朗克长度时，两端就封闭了。因此我认为，宇宙是有限的，最大值是 $1/(1.6\times10^{-35})$ 基本单位，当引入普朗克长度其值为 $1/(1.6\times10^{-35})$米，它是宇宙的最大直径值[2]。

宇宙最大直径公式 $D_{umax} = 1/\ell_P$

D_{umax} — 宇宙最大直径

ℓ_P — 普朗克长度

3.3 图 2（从右向左）

宇宙从最大（M 端）开始收缩，逐渐收缩至原点（P），再从原点开启，宇宙膨胀，物质大撕裂，最后到 L 端，宇宙至最大(汪正喜 2017, pp147-148)。

在理论上，当物质拆分至最小（L 端），也是最大宇宙时（M 端）。此时宇宙是平坦均匀的，每 1 立方米的密度都相等，宇宙是一个整体，可看作是一个巨大物质。

此时，y = ±1/2ℓ_P，n=1，则 a = $\ell_P^{\pm 2\ell P}$，

宇宙时空总体积：

$$V_{\sum(s\text{-}t)} = \pi \int_{\ell p}^{1/\ell p} \log^2 a \chi dx \quad (a>0, a\neq 1)$$

宇宙开启后膨胀至结束的时空体积：

$$V_{b(s\text{-}t)} = \pi \int_{\ell p}^{1} \log^2 a \chi dx \quad (a>0, a\neq 1)$$

我们下一步的工作是要获得测量数据，计算我们目前在时空中的位置和宇宙的大小。

3.4 宇宙原点

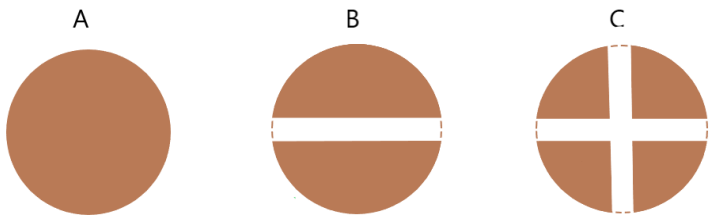
此点（x=1）在空间上的尺寸失效，从-∞～∞，没有外部空间。

3.5 横轴上的 1 应该理解为 1 个基本单位，不解读为宇宙原点尺寸是 1 米。

4. 物质分拆产生空间 [3]

4.1 物质体积的分拆

宇宙原点没有空间，开启时产生空间，物质拆分的数量越多，产生的空间越大。



三个球体，A 没有空间，C 空间比B 空间大

图 3

A,B,C 三个球体，A 没有空间，C 空间大于 B 空间。

4.2 辐射

因为质量和能量等效，能量辐射也是物质分拆的一种。辐射不是连续的，是以波的方式一份一份地发射，它们之间有间隙，间隙（空间）是辐射波产生的。

4.3 某物质的质量减少就认为是物质发生了分拆。

4.4 公式

根据爱因斯坦的质能公式 $E = mc^2$

推导出： $V_w = E/\rho c^2$

V_w—空间，单位 m3

ρ—真空能量密度，$5.96x10^{-27}kg/m^3$ (Planck Collaboration 2016)

$V=1.87x10^9 x\ E$

计算出辐射 1 焦耳能量能产生 $1.87x10^9\ m^3$ 空间，这是一个经验值。

5. 假设

5.1 物质分拆产生空间；物质释放能量的同时也在释放空间，辐射波引起空间增

长。

5.2 物质分拆产生的空间使宇宙膨胀。

6. 多元宇宙

6.1 本文确定了宇宙有界，有界就有外，外边也是可以有物的。

6.2 存在初始奇点，大爆炸开启了多元宇宙（等式（2））；我们的宇宙从普朗克长度开始（等式（5））。也就是说，当前的大爆炸理论是一个形成多元宇宙的理论，我们是子宇宙，一个成功的宇宙。

6.3 多元宇宙有各种形态：膨胀、收缩、停滞、原点时期的、过去的、将来的、对称宇宙，等等。

6.4 我们的宇宙毁灭就结束了，与下一个宇宙的诞生没有关系。

6.5 多元宇宙总质能为 0，单个宇宙质能不为 0，相邻（包括时间）宇宙质能合计可以为 0。

7. 讨论

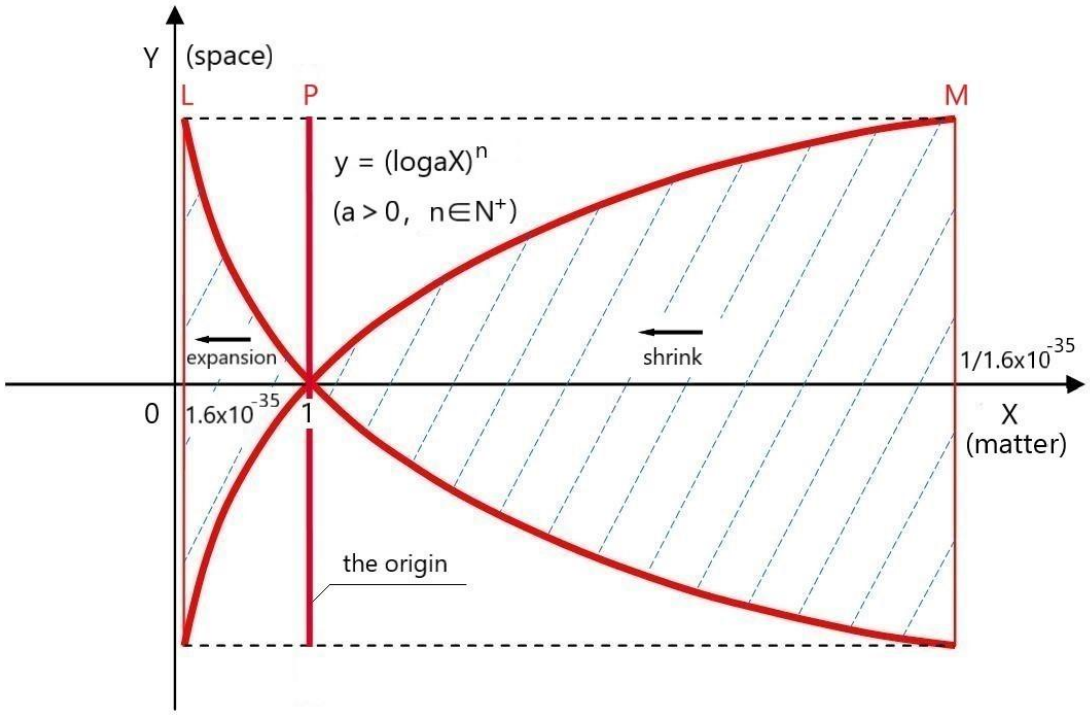


图 4

7.1 另一种解读：宇宙膨胀的过程也是收缩的过程，我们看到的膨胀实际也是在收缩，相对于原点是收缩的。膨胀与收缩同时进行，宇宙膨胀至最大，原点收缩至最小。原点不是一个，是无数个[4]，每个原点的尺寸不小于普朗克长度，宇宙从有物质开启（图 4）。

7.2 暗能量

暗能量被认为是非常均匀的，密度不是很大，除了重力之外，我们还不知道它是否通过任何基本力相互作用(Wikipedia 2022)。

如果暗能量能与星系发生引力作用，我们就回到了经典力学，是力的作用使物体运动穿越空间，这与星系退行速度超光速是矛盾的，违背了狭义相对论。

物质分拆产生空间，物质释放能量同时释放空间，是空间本身膨胀，不与其它力发生关系。

7.3 初步理论公式（能量释放产生空间）

$$V_{space} = E\lambda^4/hc$$

V_{space} —空间体积；E —能量；λ—波长；h —普朗克常数；c —光速；

7.4 关于 1 和 0、有和无、存在与不存在，它们之间的关系是一个深奥的哲学问题，本文认为它们存在关联。

在没有时间、没有空间、物理法则失效的系统中，有 2 点是确定的：有和无，逻辑。用 1 和 0 进行逻辑推导是可行的，也是一种尝试。

8. 结论

8.1 我们的宇宙从 1（正物质）开启而不是 0，-1（反物质、镜像、过去的等）是分开的，我们生活在正物质的世界中[5]。

8.2 宇宙是有限的，最大直径 $1/(1.6\times10^{-35})$ 米。

8.3 宇宙原点空间上的尺寸失效，没有外部空间。

8.4 方向（时间）与物质不能同时为正。对称宇宙与我们的方向（极性）相反[6]。

8.5 物质分拆产生空间并使宇宙膨胀。

8.6 存在多元宇宙。

注 释

1. 为什么要变化？ 因为宇宙物质是运动变化的，没有哪一秒钟是停止不动的，只有不断变化才有意义。
2. 可观察宇宙与最大宇宙相比，相当于排球与地球。
3. 本文认同圈量子引力理论，空间是由离散的块组成，存在一个最小空间。
4. 与爱因斯坦观点一致。
5. 正反是相对的。
6. 可以验证，如果发现了无法解释的粒子，就应该往这方面思考。

参考文献

Hossenfelder.S., “Can we measure structures to a precision better than the Plan ck length?”, *Class. Quantum Gra*v., 29, 115011, (2012).

Plenck Collaboration (2016). "Planck 2015 results. XIII. Cosmological paramete rs". *Astronomy & Astrophysics*. 594: A13.(31 December, 2021 https://en.w ikipedia.org/wiki/Cosmological_constant “Cosmological constant”)

汪正喜，《人类终始》. P147–148. (in Chinese, ISBN: 9789888437368, Red Publish, Hong Kong. 2017). https://books.google.com.hk/books?id=2HAnDgAAQBAJ&printsec=frontcover &dq=ISBN:+9789888437368&hl=zh-CN&sa=X&redir_esc=y&sourceid=cndr#v =onepage&q=ISBN%3A%209789888437368&f=false;

Wikipedia “Dark energy” 31 December, 2021 https://en.wikipedia.org/wiki/Dark _energy