~~Review~~ Research Article

~~On~~ Super-Large-Scale Angle~~s~~ Cosmology: A New Science of the Universe

.

ABSTRACT

We discuss formation and determination for super-large-scale structure of the galaxies and universe. ~~We~~ It is our intention to introduce the super-large-scale angle cosmological model, which ~~have~~ involves a convex surface sector, cosmic angle, angle parameter, ~~the~~ density parameter, ~~and the~~ angle parameter, and the “critical redshift.” This theory can solve the singularity problem. If the super-large-scale angle of the dark matter is greater than π, then it implies that our universe is a closed universe in curved space U. ~~Finally, there are two clear hypotheses:~~ As a “bud” of this cosmic theory, the “Thread Big Bang” and the “tangent energy” — these are two new clear hypotheses elucidated in the paper.

Keywords: Super-large-scale structure of Universe; dark matter; black hole; angle parameter; redshift.

1. INTRODUCTION

The modern era in cosmology began with Albert Einstein’s 1915 formulation of general relativity [1], which made it possible to quantitatively predict the origin, evolution, and conclusion of the universe as a whole, his sweeping extension of Newton’s theory of gravity. By embedding gravity in a geometrical picture of space and time, Einstein was able to think in grand terms about the global structure of the universe [2] (see pg. 105). The positive energy theorem in general relativity demonstrated — sixty years after its discovery — that Einstein’s theory is consistent and stable [3, 4]. Most modern, accepted theories of cosmology are based on general relativity and, more specifically, the predicted Big Bang [5, 6]. In the universe, the axion field represents a particularly attractive candidate for the dark matter [7]. Dark matter existence is inferred from gravitational effects on visible matter and gravitational lensing of background radiation [8]. Likewise, a significant amount of non-baryonic, cold matter is necessary to explain the large-scale structure of the universe [9, 10]. Hawking was able to come to his proof using mathematical techniques that had been developed by Roger Penrose, decide which order to solve the singularity problems, the introduction of the virtual time and construct the no-boundary universe model [11, 12]. The matter and the antimatter has close relationship and mutual influence, matter plays a central role in cosmology, and black holes are a favorite testing ground for quantum gravity [13]. ~~In fact,~~ The Lambda Cold Dark Matter (abbreviated ΛCDM) model affords no explanation for dark energy and dark matter in physical cosmology [19]. So, it is, in fact, merely a useful parametric form of the Big Bang cosmological model ~~[19]~~. Significantly, the Cosmology Large Angular Scale Surveyor (CLASS) is an experiment to measure the signature of a gravita-tional-wave background from inflation in the polarization of the cosmic microwave background (CMB) [21].

In our study we clearly illustrates the global geometry in super-large-scale angle for critical cosmological model (Sec. 2) can be produced by convex sector (or more precisely: convex two sectors), ~~and~~ redshift—curve relation, boundary condition (i.e. the universe is closed or not), engulf effect of black hole, Hawking radiation. ~~Finally,~~ We need to build on this momentum and there are two hypotheses: the “Thread Big Bang” (Sec. 3) and the “tangent energy” (Sec. 4), it is about our universe, which scientific explanation in support of the hypothesis.

2. SUPER-LARGE-SCALE ANGLE MODEL

An important question in cosmology: what kind of geometry is needed for the universe? Despite the lack of any meaningful practice, Gauss produced one of his most worthy intrinsic geometry of the surface, in 1827. So, Einstein emphasized the need for the Gauss’s theory of surfaces and see that the concept of this distance is physically significant [1] (see pg. 62). According to general relativity, space-time form a four-dimensional surface that is distorted by the presence of mass and this distortion goes by the name of gravity. And so, with the obsessive focus of universe, many astrophysicists now believe that supermassive black holes are at least 300 million of them dispersed across the universe, which are spinning because of appearance of objects, are the foundation for structure in the universe.

From general topology, we see that a set 1 (one), called the space, whose elements are called points. So the following theorem will help us to compute a convex for the universe, and it will also be useful when we apply global geometry theory to depicting dark matter, dark energy and black holes.

Theorem 1 (curl of U): In space, let $(U,\Im)$ be a topological space, so

$$U:\Im\rightarrow\Im,\ A:U\rightarrow\mathbb{R}^n,\ A\in U\,. \qquad (1)$$

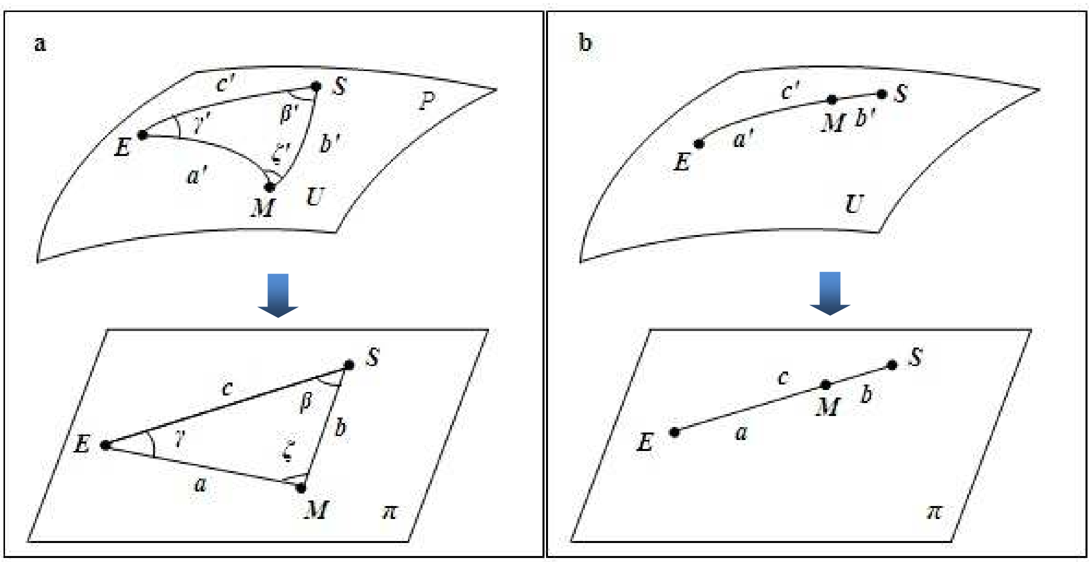
Let $\mathbb{R}^n\subset\Im$. The sector between the curve A and the curve U be a convex [18] in the Appendix in ~~figure~~ Fig. A1a~~, and we can prove the theorem 1 in the Appendix, and we show in figure A1b-A1c~~.

We can prove the theorem 1 in the Appendix, and we show in Fig. A1b-A1c.

We often went further than that, if using a parametric equation, such as the differential equation of the geodesic, only works on differential geometry — nothing else. As far as curve goes, we know, convex closed curve and circumference are homeomorphism. The shape of the curved surface, on the other hand, is associated with the curvature. If they exist, it as a point on the convex surface can be divided into three categories as its own characteristics, namely, smoothing-point (tangent cone is a plane), diamond-point (tangent cone is a dihedral), and cone-point (tangent cone is less than 2π). Let α_n be plane angle and let γ_i be dihedral, then $\partial\alpha_n/\partial\gamma_i>0$. So, the distortion of the convex polyhedron is predictable for us, by contrast, the galaxy can distort the spacetime in which it sits. Beyond that, we may see integral geometry for the convex surface in sector P. We will continue to discuss on this sector as a top priority. But there is much more to it than that. What does it mean to say that a sector is convex surface? The convex sector is a curved universe, physically. It's this curving of the fabric of the universe that gravitational waves are fluctuations in the curvature of space which propagate through the universe as gravitational waves, so outward from its source, and we feel as gravity. Meanwhile, that the light travels in curve lines is certain in the super-large-scale universe.

Now we should turn our thoughts to practical matters, we think of Earth, moon and sun as a convex triangle in vertex. In non-Einstein space, let (P,U) be a topological space, $P=\{E,M,S\}$, and let length: $a'=a$, $b'=b$ and $c'=c$. Then angle: $\zeta' \nless \zeta$, $\beta' \nless \beta$ and $\gamma' \nless \gamma$, where π is a plane, as illustrated in figure 1a.

However, during a solar eclipse, we see the moon passes between Earth and the sun, blocking most of the sun's light in ~~figure~~ Fig. 1b. That's why — the *E*, *M* and *S* is a straight line — that's not true. 'From Einstein's theory of gravity, that is his general relativity theory, we believe mass curves space and this can cause light to follow a curved path,' see [14]. By the fact that the solar eclipse exist, this tells us that ~~figure~~ Fig. 1a above is a convex triangle. A structure of the universe — the convex triangle — is defined when we give the geometry, which is simply the expression for a natural phenomenon of the solar eclipse in the curve. Our conclusions got by us from theory are supported and are proved objectively. Light or dark, *E*, *M* and *S* would always govern the surface P in the curved space U.



~~Figure~~ Fig. 1. The diagram showing that the Earth (*E*), moon (*M*) and sun (*S*) is convex. 1a Above, is a convex triangle. Below, is a plane triangle; b Above, is a curve, we believe the curve is genuine. Below, is a straight line, we believe the straight line is no genuine.

What matters most is that Hubble's law provides a concise method for measuring a galaxy's velocity in relation to our own, unfortunately it relies on one of sciences only variable constant. The critical density ρ_{crit} of the universe: it is a concept i.e. $\rho_{\text{crit}} = 3H_0^2 / 8\pi G$, here H_0 is the Hubble constant, this parameter that indicates the rate at which the universe is expanding, and distance is the galaxy's distance from the one with which it's being compared [15].

At first sight, the ~~The~~ convex two sectors P and T (in Appendix in ~~figure~~ Fig. A1b) — the malleable fabric whose geometry can be changed by the gravity of stars, planets and matter — was born.

For the super-large-scale universe, we need to have a stable super-large-scale structure and critical cosmological angle because, candidly, the critical cosmological angle is possible in physics. Our standard from for the critical cosmological angle Ψ_{crit}, is $\Psi_{\text{crit}} = \pi$.

We show the matter and dark matter for the cosmic angles $\bar{\lambda}$ in Appendix in ~~figure~~ Fig. A2a. This curved space U is characterized by two properties:

Property 1 (~~i~~ closed universe): If cosmic angles is $0 < \bar{\lambda} < \Psi_{\text{crit}}$ (or $0 < \bar{\lambda} < \pi$), then the universe is a closed universe in Appendix in Figure A2b.

Property 2 (~~ii~~ open universe): If cosmic angles is $\bar{\lambda} \geq \Psi_{\text{crit}} = \pi$, then the universe is a open universe in Appendix in Appendix in Figure A2c.

Now we remark that for convex multiple sector, in general, we have the following theorem.

Theorem 2 (all angle): Let $\bar{\lambda}_{\text{lattice}}$ be a lattice angle (i.e. all angle), and let $\alpha \in \bar{\lambda}_{\text{lattice}}$. Then

$$\bar{\lambda}_{\text{lattice}} = \sup \sum_{i=0}^{n} \alpha_i \leq 2\pi. \tag{2}$$

Explicit proof for the theorem 2:

$$\bar{\lambda}_{\text{lattice}} = \sup \sum_{i=0}^{n} \alpha_i \leq \sup \sum_{i=0}^{n} 2\pi\alpha_i < \sup \sum_{i=k}^{\infty} 2\pi\alpha_i < \sup \alpha_k \sum_{i=1}^{\infty} (2\pi)^i \overset{\lim_{k\to\infty}\alpha_k}{\underset{\alpha_k \leq \pi}{=}} 2\pi. \tag{3}$$

The proof is complete.

Interpretations for the theorem 2: The sector is surrounded by geodesics, which is convex-shaped. It has to be revolve around the lattice angle of point O.

Theorem 3 (~~all angle at the point~~ deviation lattice angle $\bar{\lambda}^{\bullet}_{\text{lattice}}$): If a deviation lattice angle ~~$\bar{\lambda}_{\text{lattice}} < 2\pi$~~ $\bar{\lambda}^{\bullet}_{\text{lattice}} < 2\pi$ and around a point in convex sector (all angle at the point), then for any a shortest distance (i.e. geodesic) shalt not go through the point (i.e. not sucked into the singularity).

Proof of theorem 3: If $\exists\varepsilon$ (e.g. the angle ε is made of two geodesics) and let $\varepsilon \in \bar{\lambda}_{\text{lattice}}$, $\bar{\lambda}^{\bullet}_{\text{lattice}} \in \bar{\lambda}_{\text{lattice}}$. By Theorem 2, therefore, we may assume that $\alpha_k \cap \varepsilon \neq \phi$ and $k \to \infty$, we conclude that $\bar{\lambda}_{\text{lattice}} - \varepsilon$, then $\bar{\lambda}^{\bullet}_{\text{lattice}} < 2\pi$ and the proof is complete.

Interpretations for the theorem 3: It is easy to deduce Theorem 3 from Theorem 2. The new theorems also suggest that baryon were even fewer (or even one) common in the early universe than previously thought. (It's known as "baryon asymmetry" among physicists.) They should still be lurking within delta of geodesics.

But, to our universe, we will introduce what we call the relative angle μ, which we about to define.

Definition 1 (relative angle): Let $\alpha \subseteq \bar{\lambda}_{\text{lattice}}$ be a sub-angle (current angle), and $0 < \alpha < \pi$, then the relative angle μ is

$$\mu = \alpha^{-1}\bar{\lambda}_{\text{lattice}} . \tag{4}$$

So, absolute angle, that is π.

In general, z is called the redshift [16]. We can now begin our study of the redshift — curve relation~~.~~ and determine the critical redshift.

~~Theorem 4 (redshift — curve relation):~~ Let d is the curve length and l is the geodesic length. ~~then~~ The redshift — curve relational expression is

$$\frac{d}{l} \geq \cos\frac{1}{2}(1+z)^2 , \tag{5}$$

where d means the curve length comes from distance of the luminosity.

The ~~M~~maximum redshift:

$$z_{\text{crit}} = 2.545 \text{ (i.e. critical redshift).}$$

Physical law 1 (boundary condition): If ρ_{matter} (or $\rho_{\text{dark-matter}}$) is matter (or dark matter) density and z is redshift. Then

$$\rho_{\text{matter}} < \rho_{\text{dark-matter}} \text{ iff } z < 2.545 . \tag{6}$$

Interpretations for the Physical law 1 ~~(boundary condition)~~: The redshift 2.545 as a dividing line is far from a physical barrier, but it practically assures our universe there would be a stable condition. Now, we can see very early universe and open universe, such as the star formation appears at the large redshifts $z \geq 6$.

Of particular concern is cosmic angles $\bar{\lambda} = 0$ (i.e. is that the thing, singularity), which is sparking a Big Bang [17] and [1] (see pg. 128) of explanation for $\Omega_0 = 1$ (i.e. is suppose to be the density parameter). The Big Bang of space for the limit $\bar{\lambda} \to 0$. This is nothing but the stereotype, if the flatten matter appears to be rabid pit bull, then the universe began extremely hot and dense for the Big Bang ($t = 0, G = 0$). Afterwards, they must be the cooled and the expanded, which would assemble their sets.

In fact, cosmic angles are valuable in cosmology. But at present, λ exactly what — and what that the ages of the universe T_0 — have been maddeningly hard to pin down. It may be due to further problems hidden within the dark matter distribution across, and this is about curvature of space and the critical cosmological density ρ_{crit} .

We now look for the Ψ_{crit}-critical cosmological angle in the following form:

The angle parameter:

$$\Lambda_0 = \Psi_0 / \Psi_{\text{crit}}, \qquad (7)$$

where $\Psi_{\text{crit}} = \pi$, Ψ_0 is the current angle of the universe, we also find that

$$\Psi_0 = 2\mu^{-1}. \qquad (8)$$

The density parameter Ω_0, with the angle parameter Λ_0, we take

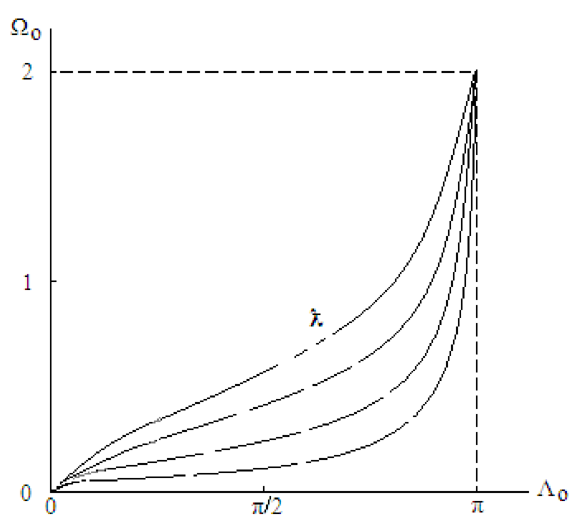
$$\Omega_0 \propto 2(\pi)^{-n} \Lambda_0^n, \; n \geq 1. \qquad (9)$$

So, if $n = 1$, then density parameter $\Omega_0 = 2$.

We find that the parameter relation in the classical limit depends on the solution of integral equation:

$$2(\pi)^{-n} \int_0^{\pi} \Lambda_0^n \, d\Lambda_0 = \frac{2\pi}{1+n}, \; n \geq 1. \qquad (10)$$

This $\Omega_0 - \Lambda_0$ relation is in ~~figure~~ Fig. 2.



~~Figure~~ Fig. 2. $\Omega_0 - \Lambda_0$ **relation curves.**

The limit $\bar{\lambda}_0^{\pi}$:

Case 1 ~~(i)~~: If $\Lambda_0 = \pi$, then $\Omega_0 = 2$.

Case 2 ~~(ii)~~: If $\Lambda_0 = 0$, then $\Omega_0 = 0$.

Physical law 2 (closed-world model): Let $\bar{\lambda}_{\text{matter}}$ be a matter super-large-scale angle set and $\bar{\lambda}_{\text{dark-matter}}$ be a dark mater super-large-scale angle set. If $\bar{\lambda}_{\text{matter}} + \bar{\lambda}_{\text{dark-matter}} = \bar{\lambda}_{\text{lattice}} = 2\pi$, and satisfies $\bar{\lambda}_{\text{matter}} < \bar{\lambda}_{\text{dark-matter}}$, the universe is closed (conversely, if $\bar{\lambda}_{\text{matter}} > \bar{\lambda}_{\text{dark-matter}}$, the universe is open).

The current angle α case: We know Keck, HST, ROSAT and Infrared Astronomy Satellite (IRAS) are helping astronomers estimate z and T_0 (i.e. the age of the universe at 13.7 billion years old) and expansion rate of the universe as well as allowing them to watch the birth of stars in other galaxies. In theory, T_0 is already a good value because it easier to convert this into an estimate of what α.

3. THREAD BIG BANG

As our first application, it also infers from the super-large-scale angle cosmological model that the Thread Big Bang that happens is inevitable. Consider Fig. 3 where we show Thread Big Bang of the universe — matter area, antimatter area, dark matter area, and Thread Big Bang area. It is useful to have a picture at hand.

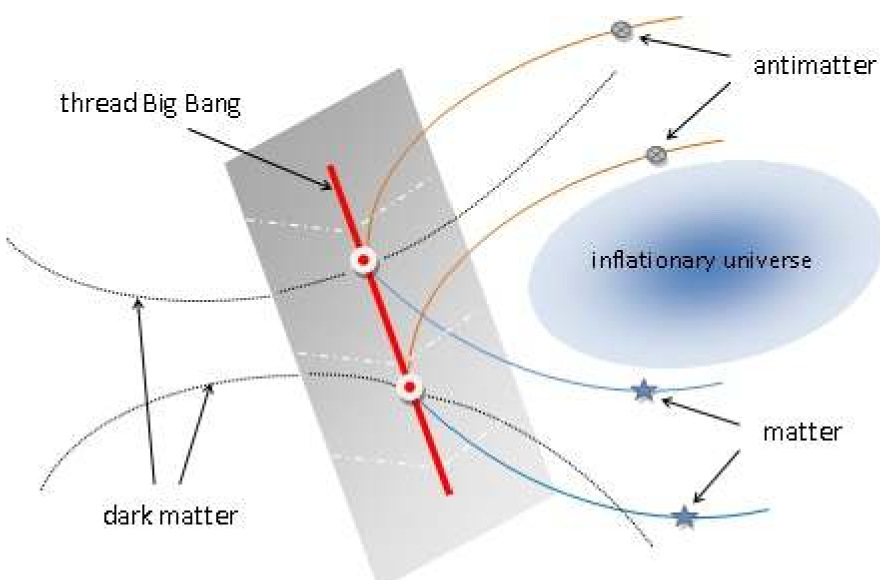


Fig. 3. This figure shows the Thread Big Bang of the universe, due to the super-large-scale angle.

To us, indeed, the Thread Big Bang model is a new inflationary universe theory. The theory involves angle parameter Λ_0, it is what provides an exciting new tool with which to probe the age of the universe to try to shed some light on a mysterious antigravity force called dark energy. Now, we have hypothesis as well, and the result follows:

Thread Big Bang: If $\lambdabar \gtrsim 0$ (i.e. minimal angle), then a thread (curve) has at least two Big Bang (i.e. diamond-point and cone-point) — that is, the Thread Big Bang (the cause is the tangent energy pushing on the matter in the Thread Big Bang). Albeit preliminary, our result lends credence to the hypothesis. It all started with the Thread Big Bang. So, the universe is an unimaginably vast space filled with planets, stars, systems, nebulae, gas, dust — and it's impossible for us to ever explore it all. For example, we can believe such a thing given our Earth and sun come from two different Big Bangs in thread. The THREAD BIG BANG of space for $\lambdabar$ $(0 < \lambdabar \le \pi)$. ~~The universe is as an open book. Can you imagine the book, open it quickly (e.g. 10^{-43} second), if~~ If such collisions would have left lasting marks in the cosmic microwave background (CMB) radiation, the diffuse light left over from the Thread Big Bang that pervades the universe. ~~So, an interesting point: In the 'cosmic book' — Earth of page — is where?~~

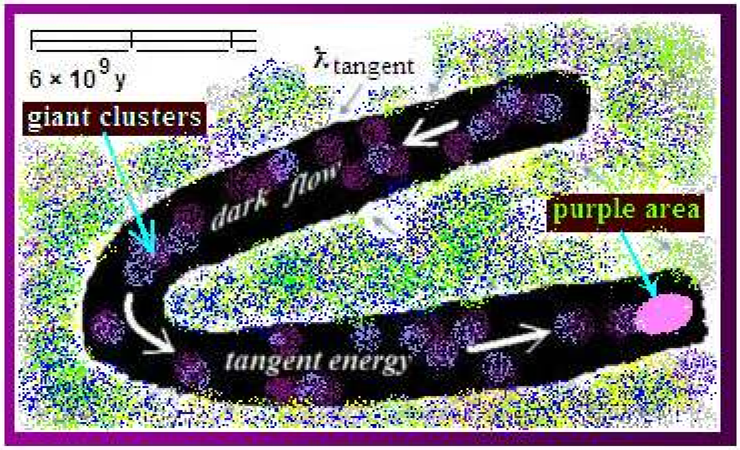
4. TANGENT ENERGY

The tangent energy: For origin of galaxies and the super-large-scale structure of the universe, the dark flow in the universe to be moving at very high speeds and in a uniform direction, which is described as a basic universe structure to form a "ring" dark matter. Thus, we figured that the stuff is pulling this dark patches of matter should be the tangent energy (giant clusters of galaxies warped space time) — and this tangent energy transmutes into the matter of the dark patches.

The tangent angle $\lambdabar_{\text{tangent}}$ is variable, we can simply write

$$0 < \lambdabar_{\text{tangent}} \le \pi / 4 . \qquad (11)$$

So that winded doesn't lose all tangent energy in the transmitting process. The dark flow are the vitals of the universe, its main function is to produce tangent energy in ~~figure 3~~ Fig. 4.



~~Figure 3~~ Fig. 4. ~~The diagram showing that~~ One of the possible picture of the tangent energy, and the dark flow of space and located about 6 billion light-years.

If density parameter $\Omega_0 = 2$, then tangent energy model should be in harmony with a series of features of the super-large-scale distribution in galaxies.

If we can find the tangent energy, perhaps we can determine the source is produced by a supermassive black hole (e.g. 10^6 to 10^9 $M_{\odot}$). Therefore, supermassive black holes in the cores of galaxies really are the result of many lighter black holes merging together [22].

It will be seen from what we have mentioned before that tangent energy is the energy due to motion of "ring" dark matter (or contraction and bounce). The tangent energy increases, helping to speed the inflation of the universe. Dark matter is an invisible form of matter that accounts for most of the cosmic mass [20] (see pg. 190). Although it has never been seen, tangent energy makes up about 5 percent of the matter in the universe in Fig. 5.

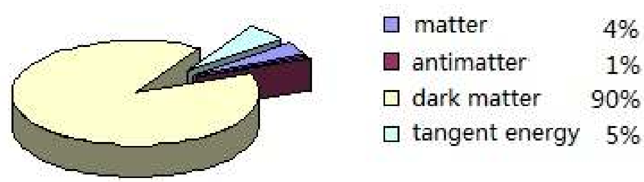


Fig. 5. We show cosmic mass with four components, including matter, antimatter, dark matter and tangent energy.

In the "ring" dark matter case, the "transparent" matter is material composed of antigraviton, which encounters between gravitons and antigravitons lead to the annihilation of both, giving rise to varying proportions of hyperon star, the property for the same reason that antimatters annihilation.

5. CONCLUSIONS

From all the above, proves that super-large-scale angle cosmology can really solve the problems and explain the phenomena in the universe, as of a new theory. Let us here briefly summarize the paper.

Our universes were to be born of the redshift of about 2.545. It's going to obey Physical law 1 (i.e. boundary condition $\rho_{\text{matter}} < \rho_{\text{dark-matter}}$ iff $z < 2.545$) and Physical law 2 (i.e. closed-world model $0 < \bar{\lambda} < \Psi_{\text{crit}}$). ~~Essentially, the universe is no singularity.~~ Our conclusions: there is no evidence of singularity in our universe. In cosmology it means: during the Thread Big Bang no equal amounts of matter and antimatter should have been created. We, however, have the determination of cosmological parameters (i.e. $\bar{\lambda}^{\bullet}_{\text{lattice}}$, μ, $\rho_{\text{dark-matter}}$, z_{crit}, $\bar{\lambda}_0^{\pi}$). There are two hypotheses about our universe (i.e. the Thread Big Bang and the tangent energy), which scientific explanation in support of the hypothesis. In super-large-scale structure of the universe, the tangent energy contributes approximately 5% of all cosmic mass, and its number is the sum of the matter and antimatter.

ACKNOWLEDGMENT

The author is grateful to the four anonymous referees for useful comments and suggestions.

INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Explicit proof for the theorem1:

Let GU^{Δ} and GA^{Δ} be drawing out two geodesics from vertex G, and minimal neighborhood of the vertex G is split into two sectors P and T. Let X and Y be two points in sector P, and X, Y adjacent to G so that geodesic XY^{Δ} cannot bypass the curve $GU^{\sim}$ and $GA^{\sim}$ in ~~figure~~ Fig. A1b. Let point E on GU. Then:

(i) Point F on $GA^{\sim}$ in ~~figure~~ Fig. A1b.

(ii) Point F on $GU^{\sim}$ in ~~figure~~ Fig. A1c.

For part (i), let geodesic $EF^{\sim}$ and XY^{Δ} on the outside of sector P, than the intersection of the G and $EF^{\sim}$. Notice that $EF^{\sim}$ be a segment of geodesic XY^{Δ}. With the same $EG^{\sim}$ on $EF^{\sim}$, and also on GU^{Δ}, as in the $FG^{\sim}$ on $EF^{\sim}$, and also on GA^{Δ}, then geodesic:

$$EF^{\Delta} = GU^{\Delta} \vee GA^{\Delta}. \qquad (11)$$

So we conclude that G on the outside of XY^{Δ}. However, this is impossible.

For part (ii), let F , E on geodesic GU^{Δ} , with the same $EF^{\sim}$ on XY^{Δ} , and also on GU^{Δ} , so the $EF^{\sim}$ of the geodesic XY^{Δ} replaced by the $EF^{\sim}$ of the GU^{Δ} , as in all segment on geodesic XY^{Δ} , substitute them completely, (In universal logic, the substitution principle we could use here.) and though it is outside sector P . Prove that P is convex.

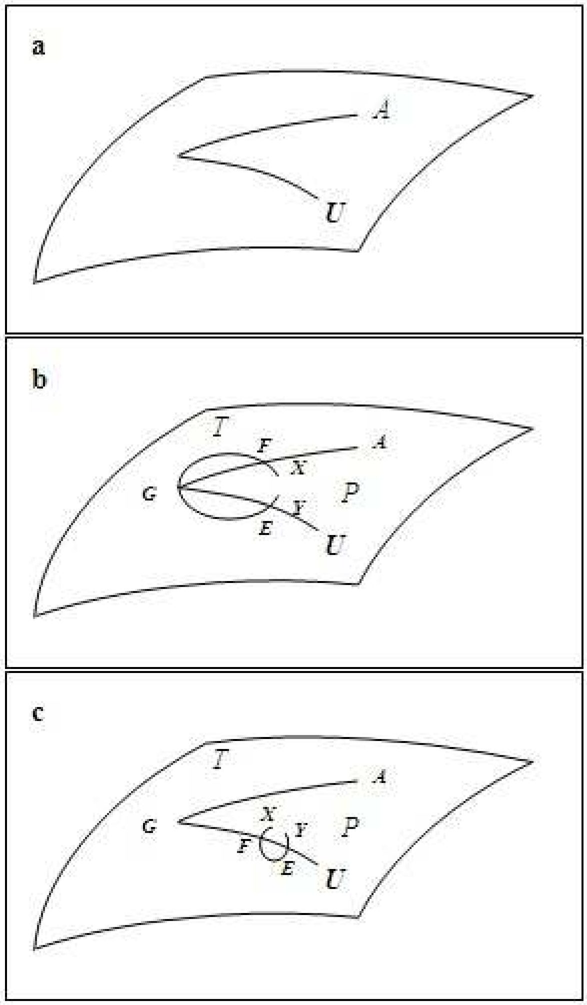

Fig. A1. A1a The sector between the curve A and the curve U be a convex; b and c The diagram showing that the sector P is convex; b Point F on GA; c Point F on GU.

The matter and dark matter for the cosmic angles λ in ~~figure~~ Fig. A2.

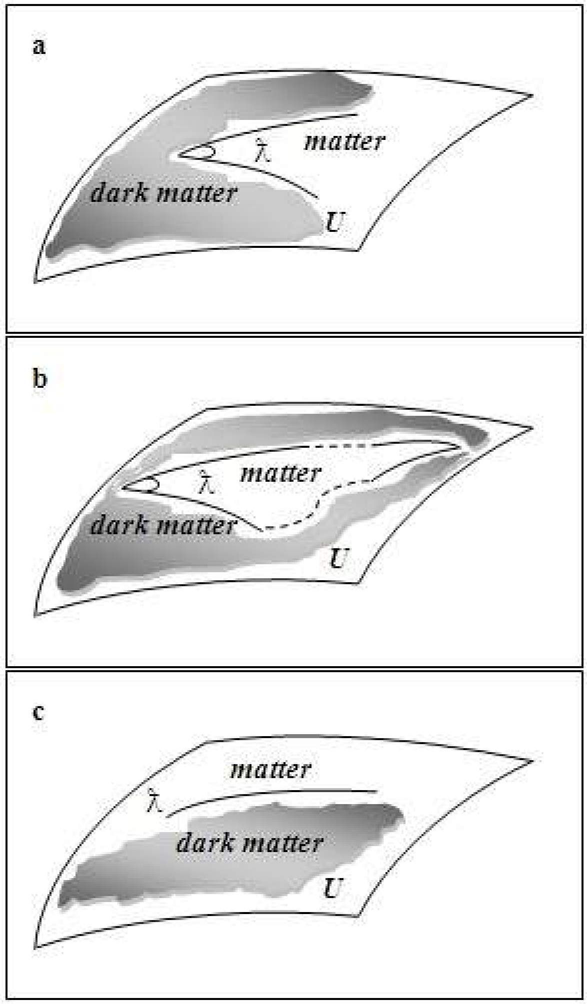

Fig. A2. The diagram showing that the shapes of space for the Ψ_{crit}-critical angle, and the dark matter are gray-shadowed. A2a and b If cosmic angle $0 < \hat{\lambda} < \Psi_{crit}$, then the universe is a closed; c If cosmic angle $\hat{\lambda} \geq \Psi_{crit} = \pi$, then the universe is a open.