Hypothesis on the Origin of the Universe Cosmological Structure of Inside Out Space

Update 2019/04/23　S.Aada

A summary of the conclusions.

(1) Overview of the Universe's Origin

It is said that our universe is in the process of falling freely in a huge cosmic black hole (of a class of over several trillions of light-years) created in the expansive outer space. We cannot see this outer space from our space, but it is sparse, vast, and at ultra-high temperature.

If the universe falls freely beyond the Schwarzschild radius in the black hole, it will become an inverted space where the core will spread over the whole sky and be enveloped by the event horizon concealing the core. This is the cosmic space which we know. The event horizon is a region that is pitch black, at absolute zero and where time has stopped. It is the same as the state of the farthest universe we see.

Gravity is balanced in this inverted space creating a state of weightlessness, since a high velocity has already been acquired with the falling process, the distance to the core shrinks at a uniform velocity.

In this space, the farther a celestial body as seen from the observer, the closer (lower) it is to the core, more is the gravitational redshift caused by the difference in the gravitational potential.

This redshift of distant celestial bodies increases with time since the gravitational gradient also increases with the fall. Since this is accelerated expansion, it is difficult to explain using the expanding universe theory, but it can be easily explained as an inevitable consequence according to the theory of this study. Refer to the text for details

(2) Overview of the Elemental Composition of Our Cosmic Space and Explanation of Cosmic 2.7 K Background Radiation

In the ultra-high temperature outer space (refer to the text), surrounding space is cooled by the influence of the black hole. The average temperature in the outer space is estimated to be 1015 K or more, and space is cooled as it gets closer to the black hole, and substances such as electrons and protons are formed.

As it gets even closer, protons and electrons fuse to form helium nuclei, but the reaction does not advance further as they are extremely sparse. Because of this, most of the matter that existed in our cosmic space had originated from hydrogen and helium atoms.

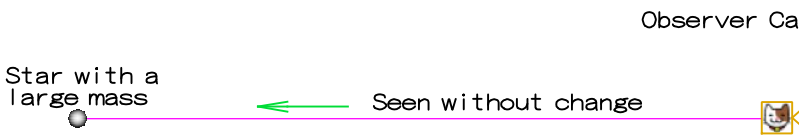
If our cosmic space falls further and crosses the Schwarzschild radius, space will invert and completely close, forming a closed space isolated from the outer space, and start cooling rapidly to absolute zero.

However, just before space closes, it will entrap the radiation of space temperature 3000K, which is observed to be the 2.7K background radiation from a region near the event horizon with a very high time-delay (1/1100). Refer to the text for details.

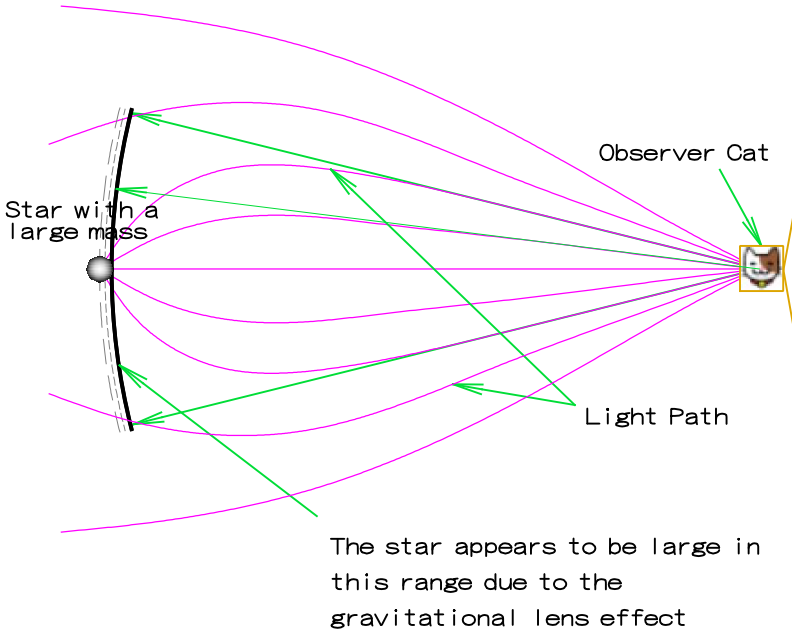
(3) Overview of the Elucidation on the Mysterious Movements of the Milky Way Galaxy

Electron-positron conjugate and proton-antiproton conjugate are proposed as specific dark matter candidates for the mystery of the rotational velocity of the Milky Way galaxy. Refer to the text for details.

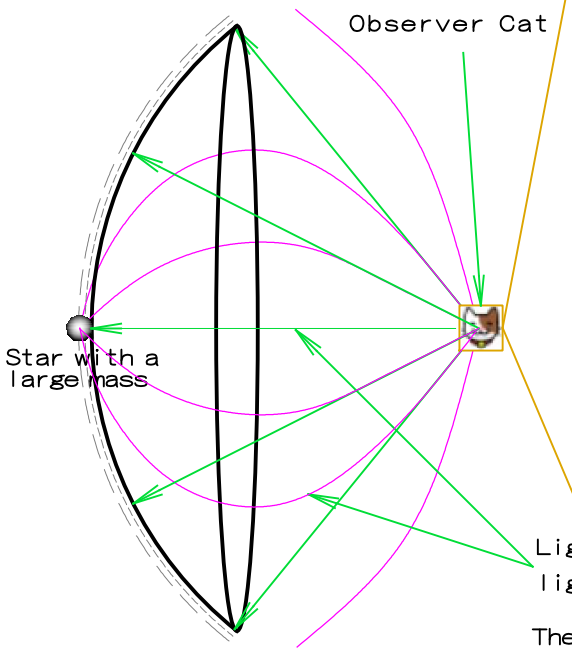
Analogy (1) Situation When an Observer Falls and Approaches a Massive Star



When the observer is far from the massive star and influence of the gravitational field is small, the star is seen without any change



As the observer approaches the massive star, the light path bends due to the effect of the gravitational field, as shown in the figure on the left. The enormous star appears to be larger than its actual size to the observer due to the gravitational lens effect, as shown in the figure on the left. In other words, the surface of the massive star can be seen in all directions of light arriving from the massive star.



As the observer cat approaches the star, the light path bends significantly, and the massive star appears even bigger. This appearance is deceptive, and the star exists in a place where it is actually seen. The three-dimensional space structure is of this type. As all the light paths between the massive star and the observer are the shortest distance between two points, all light paths are equal. In other words, the surface of the massive star spreads over equal distances. Therefore, for the observer, it looks like being enveloped inside a sphere.

Light path: In reality, the length of all light paths is equal.

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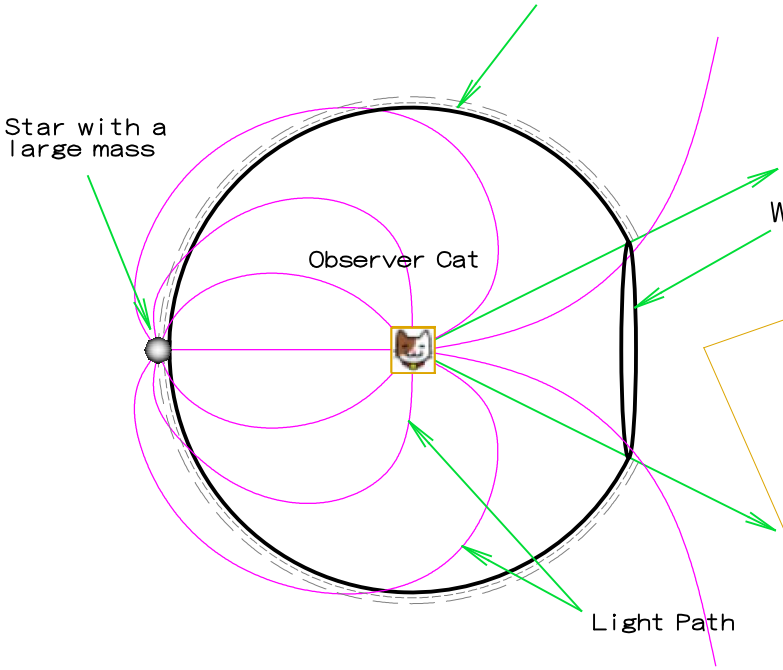
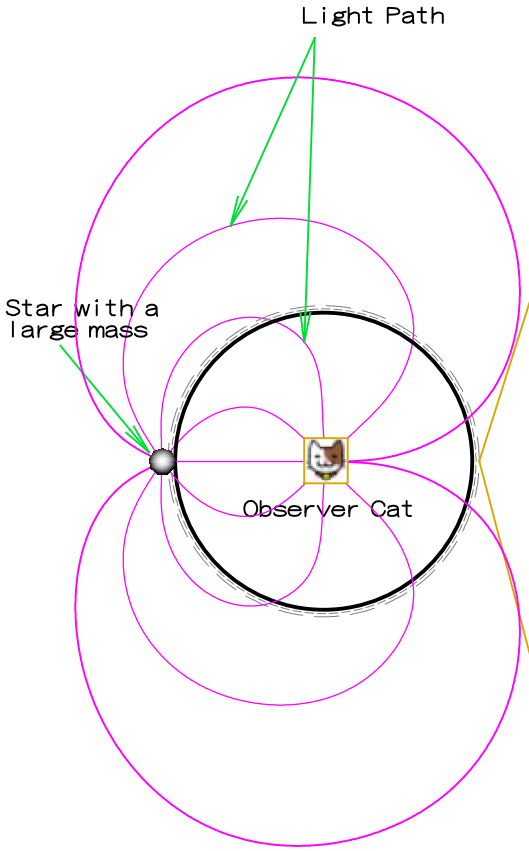
Covered by the surface of the massive star.



As the observer gets closer, most of the light paths seen by the observer reach the massive star. When this happens, the outside world can be seen only from the window shown in the figure on the right, and the surface of the massive star occupies the rest of the field of view.

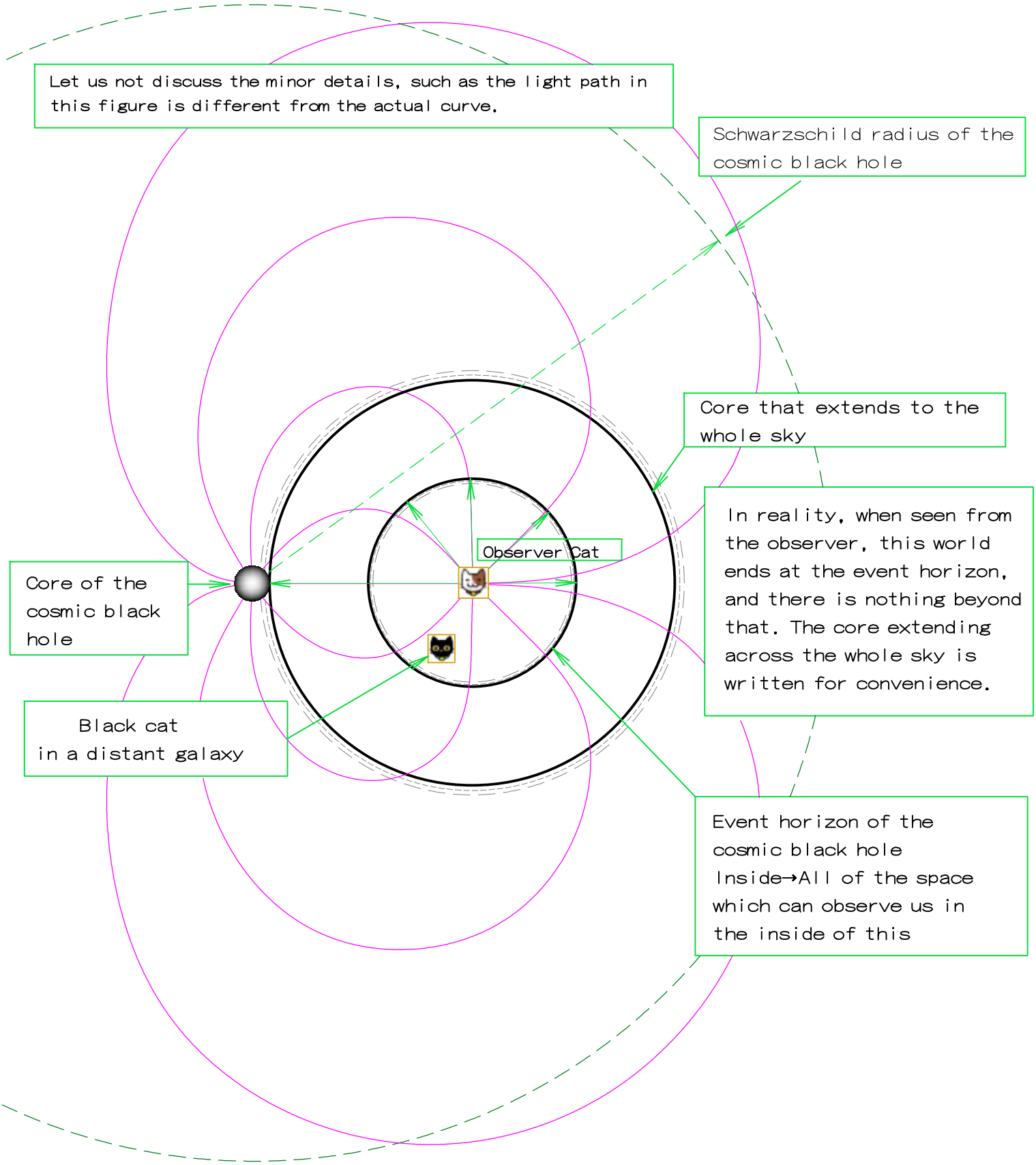


As the observer gets closer, all the light paths from the observer reach the massive star. When this happens, window to the outside world disappears. This closed space is non-directional and is uniform like the inner surface of a sphere. Since this how the space structure is in reality, the massive star exists equidistantly in all directions seen by the observer. Therefore, gravity is balanced, and the observer is in a state of weightlessness. However, the farther a position is from the observer, the closer it is to the massive star, and hence, gravitational redshift and time delay are observed.

Analogy (2) If a Massive Star is a Cosmic Black Hole

Here, the cosmic black hole is assumed to be an enormous black hole, which incorporates all of the outer space that we know of, as a part of it. It is assumed that the Schwarzschild radius of the hole is several trillions of light years or more.

The space that we know of is the space enveloped in the event horizon of the cosmic black hole as seen from the observer in the figure above.



The event horizon is a region, from where things thrown, require the speed of light to reach the observer.

If a distant observer sees the cosmic black hole, it exists at the Schwarzschild radius. But it is not the case for a falling observer cat.

As the observer approaches the Schwarzschild radius while in a free fall, the event horizon is seen to be receding. As the observer goes even closer, the event horizon envelops the observer encompassing the core and space is completely closed at the stage when the Schwarzschild radius is exceeded, and it becomes a closed space enveloped by the event horizon as shown in the above figure.

In this way, the cosmic space we know of is completely enveloped in the event horizon of the cosmic black hole. Further, in this space structure, as the core of the cosmic black hole exists equidistantly in all directions, gravity is balanced, resulting in a state of weightlessness.

This is also the case when seen from other places within this space (for example, a black cat living in a distant galaxy), and the cat is also seen to be at the center of the sphere.

Since the black cat of the distant galaxy is close to the core as seen from the observer cat, its gravitational potential is low, and the light coming from it is redshifted.

Time is also delayed by the rate at which the wavelength is extended. This is also the case when seen from the black cat.

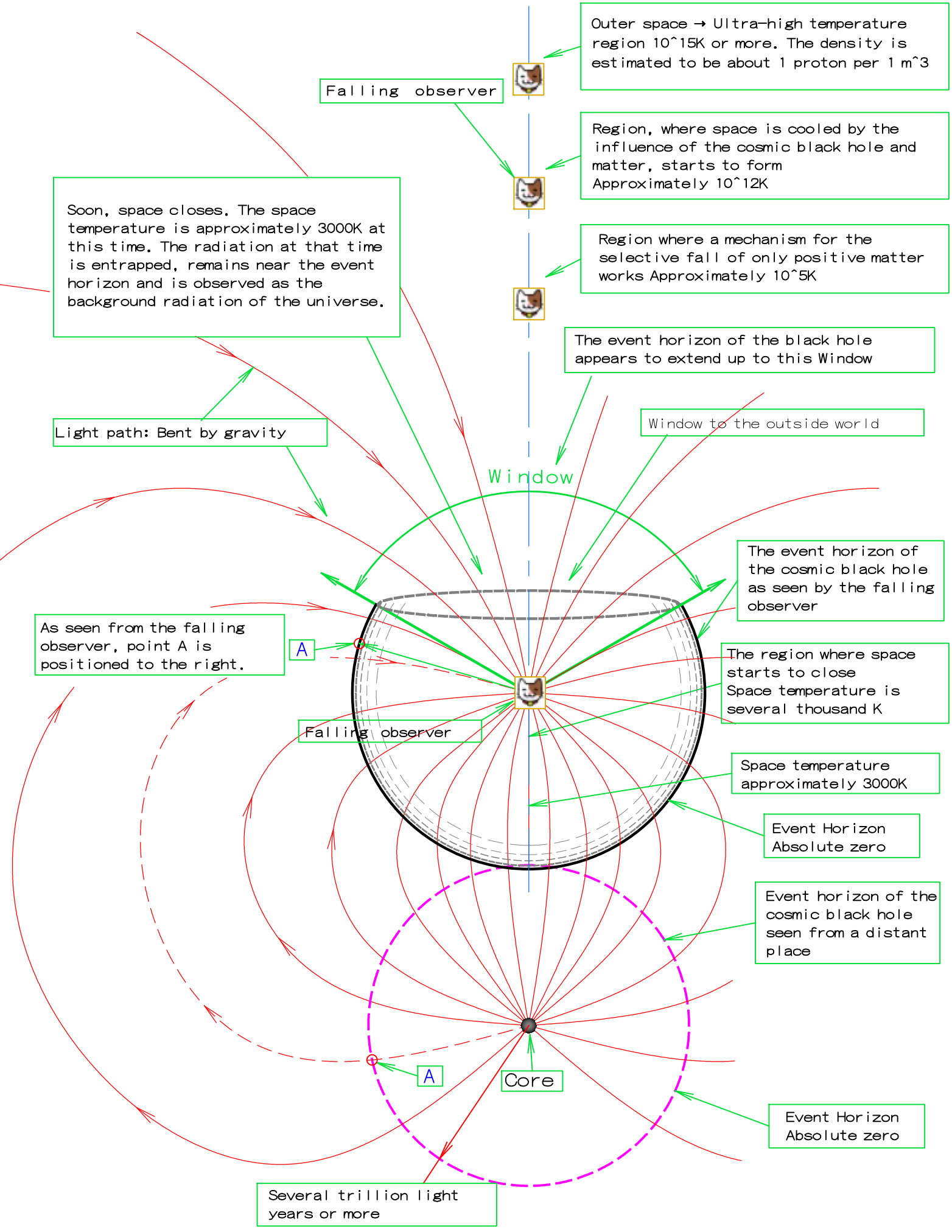
If viewed from the black cat, we are seen to be at the center, and the galaxy with our observer cat is far away and appears to be redshifted as it is close to the core.

Due to this space structure, the falling body is not subject to gravitational acceleration.

However, since it has a large initial velocity (almost the speed of light) due to the process up to that time, the distance between the observer cat and the core shrinks at a uniform velocity, and a collision will occur someday.

Origin of our Universe (1)

Formation of matter, selective fall of positive matter, just before the closing of space



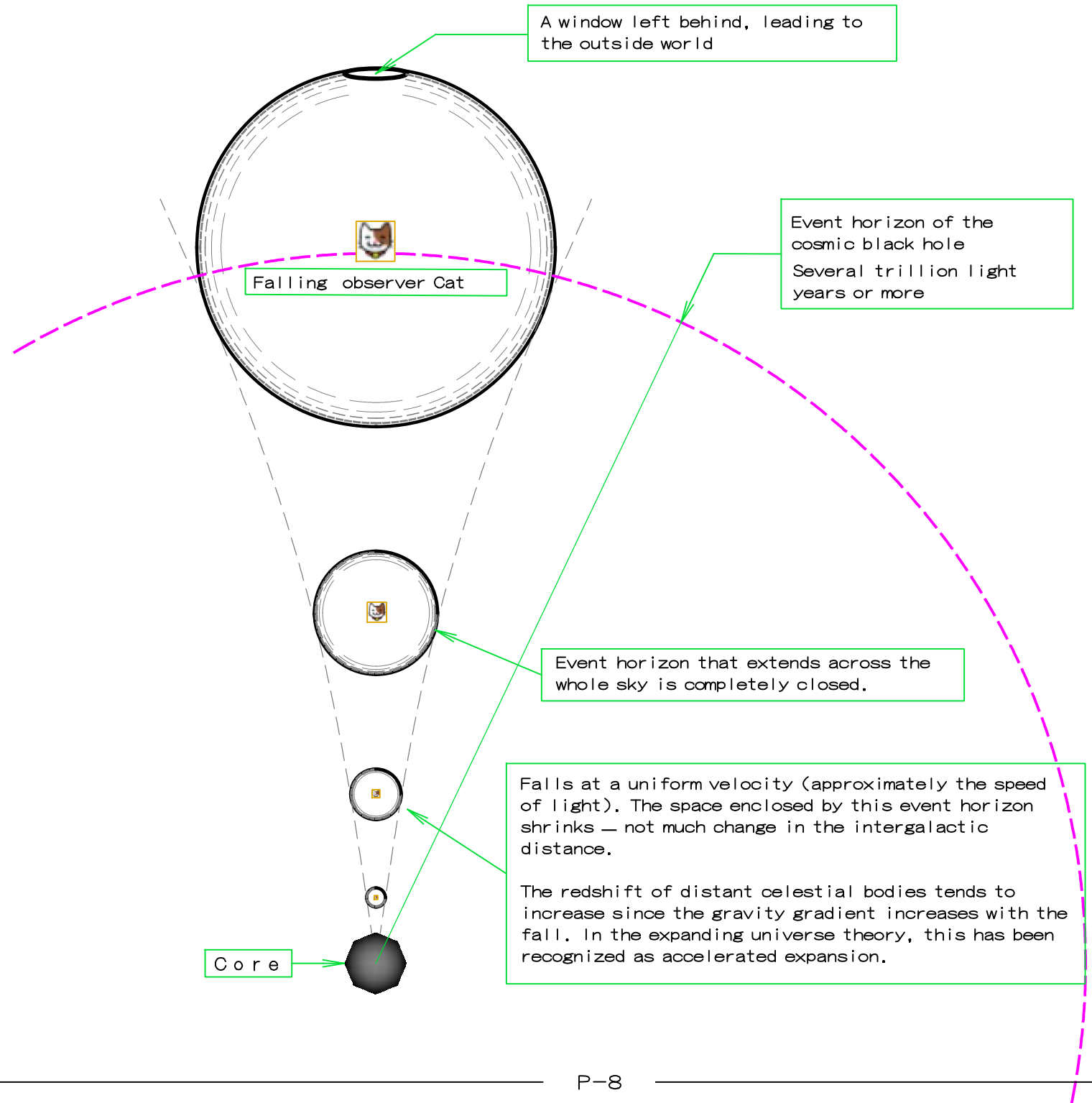
Origin of our Universe (2)

Closure of cosmic space, the subsequent evolution of the universe, and the end

If the universe falls beyond the Schwarzschild radius of the cosmic black hole, the window leading to the outside world will close, and the universe will become a completely closed space. If there is no rotation and revolution during the fall, space will have no directionality.

At this stage, there is no increase in kinetic energy, no matter how much the universe falls. This is because, the core, which extends across the whole sky is equidistant when viewed from all the observers in this space, and this balances gravity leading to a state of weightlessness.

However, there is a gravitational redshift. When viewed from all the observers, as you approach the event horizon, the redshift increases, and time is also delayed. This is because, in any direction, the farther the distance, the closer it is to the core, and this gives rise to a difference in the gravitational potential.



Age of the Universe, Summary of Other Items

Age of the Universe

If the passage of time after the closure of space is defined as the age of the universe in that place, the periphery of our galaxy will be around 13 to16 billion years, as estimated based on various data.

In that case, how old must the distant galaxy that is 10 billion light-years ahead be? If the fall velocity is approximately the speed of light, then the galaxy that is 10 billion light years ahead will be a space that started falling about 10 billion years earlier than the periphery of our galaxy and is assumed to be approximately 10 billion years older than our galaxy.

However, since it takes approximately 10 billion years for optical information to reach our galaxy from that distant galaxy, in that time the galaxies in our periphery will gain 10 billion years, and as a result, the age of distant galaxies and galaxies in our periphery is not much different.

However, distant galaxies are significantly redshifted by gravity. If the redshift is 4, the wavelength is approximately five times, and the frequency is approximately 1/5. Thereby, the progress of time will also be approximately 1/5. Therefore, farther the galaxy, the age of the universe is observed to be younger due to the effect of time delay. For example, if the redshift is 4, then the age of the universe is about 1/5th, which is approximately 3 billion years.

This is considerably older than the age of the universe, as assumed in the Big Bang Theory. In the Big Bang Theory, the age after the clearing of the Universe (approximately the same time as the closing of space discussed in this theory) will be less than several hundred million years old if it is a galaxy that is 13 billion light years ahead. The most significant problem with the Big Bang Theory is that a galaxy is required to be formed in that short period.

According to this theory, the estimated age of distant galaxies is even older than that in the Big Bang Theory, and the development of galaxies starts well before the closing of space. It is estimated that the development of galaxies takes a very long time, and with this theory, it is possible to assume a sufficiently long time.

Background Radiation of the Universe

The temperature of outer space when space closed was approximately 3000K. Also, when space closed, the radiation was trapped, and there was no further supply from outer space.

Entrapped radiation takes over 10 billion years to be absorbed in the event horizon.
The afterglow of the radiation from near the event horizon even reaches our galaxy.
That is a place where the redshift is about 1100. In this place, since the speed of time is approximately 1/1100, it would be like watching a space of about 10 million years after the closure of space.

Perhaps around this age of the Universe, it is estimated that a large amount of dust, which has not yet accumulated, is floating near the event horizon and that would reflect 3000K radiation which reaches us as 2.7K radiation due to redshift.

The Core of the Cosmic Black Hole Will Not Have a Very High Density

It is often explained that the core of the black hole causes gravitational collapse and becomes a singular point of infinite density, but this is probably not correct. The reason is that, as explained before, there is no gravitational acceleration due to the sudden change of the space structure with the fall beyond the Schwarzschild radius.

Since the fall velocity of the falling object is close to the speed of light, it will momentarily exert a large compressive force when colliding with the core, but since it will be in a state of weightlessness when it stops, the compression of the core does not take place no matter how much force is exerted. From the viewpoint of the outside observer as well, the falling object will stand still at the Schwarzschild radius forever. It is probably wrong to assume that infinite compression will occur.

The infinite compression can be denied even from the perspective of the mass-energy conservation law. The kinetic energy of the falling object will reach E = mc2 when it falls up to the Schwarzschild radius. If the energy-mass conservation law is applied to the entire black hole, the kinetic energy cannot increase beyond this. From this point as well, it is derived that weightlessness is achieved when going beyond the Schwarzschild radius.

Celestial Redshift

The farther away from our galaxy, the closer it is to the core of the universe, and hence a redshift is observed due to the difference in the gravitational potential. Since all the celestial objects in our cosmic space are moving at almost the same speed with respect to the core, there is hardly any change in the distance between all the celestial objects and our planet.

Since the distance between us and the core with its accompanying event horizon shrinks at nearly the same speed, distant celestial objects gradually disappear into the event horizon.
The redshift increases gradually since the same celestial objects disappear into the event horizon.
According to the Big Bang theory.　this is accelerated expansion, an observational fact that was difficult to explain.According to the theory of this study, it is a natural phenomenon.

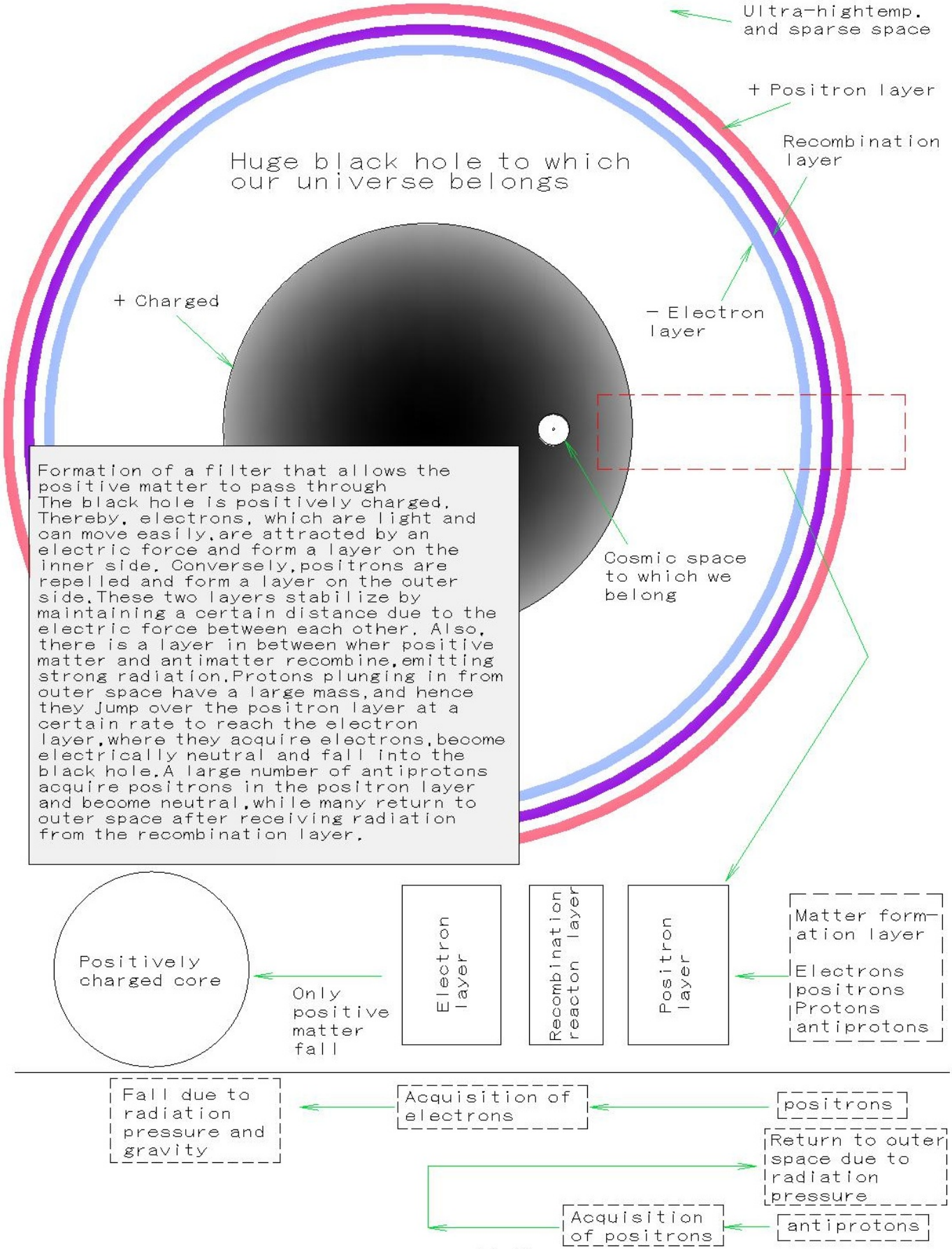
Outer Space

Why is outer space at such a high temperature? It is not necessary that the temperature will be high as a whole since there are also cases where only the periphery of the cosmic black hole is hot because of matter falling at speeds close to the speed of light into the cosmic black hole. Even when the temperature is high as a whole, the heat source is likely the energy of matter falling into the black hole. Furthermore, outer space must be a closed space as a whole due to its mass. Therefore, there is a build-up of energy, and the temperature becomes high.

The Reason Why Our Universe is Composed Almost Only of Positive Matter and Antimatter Cannot Be Found

When the matter is created, it is usual for positive matter and antimatter to be created in pairs.
However, antimatter does not exist in the cosmic space we see.
The solution for this, as described later in this theory is that a filter that only allows the positive matter to pass was formed in outer space.
This is based on the assumption that a cosmic black hole is positively charged, but also, it would be inferred that the separation of positive matter and antimatter was performed by the effect of rotation and magnetic field of the cosmic black hole.
The Big Bang theory fails to explain this, providing only uncertain assumptions such as breaking of symmetry, but various hypotheses are easily possible with the theory of this study. For details refer to the next section.

An Explanatory Drawing on the Reason Why Our Universe Has Only Positive Matter



Growth of Galaxies and Formation of Cluster of Galaxies Structure

A very accurate inference is not possible in this case. It will be a story that will be considerably imaginative.

The formation of galaxies and cluster of galaxies began in the outer space before the cosmic space closed.

The space temperature of the region was still very hot. Many small black holes were also generated in the region, and it took a long time before the absorption of substances and energy to start. Since the space temperature is high, not only photons but also protons, atoms of hydrogen and helium are at high-speed thermal motion. For example, the average velocity reaches 350 km/s at 3,000,000°C in the case of hydrogen atoms.

The velocity of photons is 300,000 km/s. In that state, over time, many particles and energy flow into the black holes and grow to hundreds of millions of solar masses. When the space temperature is low, the growth is slow because the accumulation is only due to gravity, but the process is fast in high-temperature space.

After this, the particles and energy formed the core, and the base of the galaxy was formed. When this happens, the galaxy is subject to a strong impact of gravity, and due to the influence of gravitational binding of each galaxy, the galaxies fall into the cosmic black hole in a somewhat consolidated manner.

Next, the space closed and was cooled, and galaxies and clusters of galaxies, as can be seen now, started growing.

Comparison of the Merits and Demerits of This Theory and the Big Bang Theory

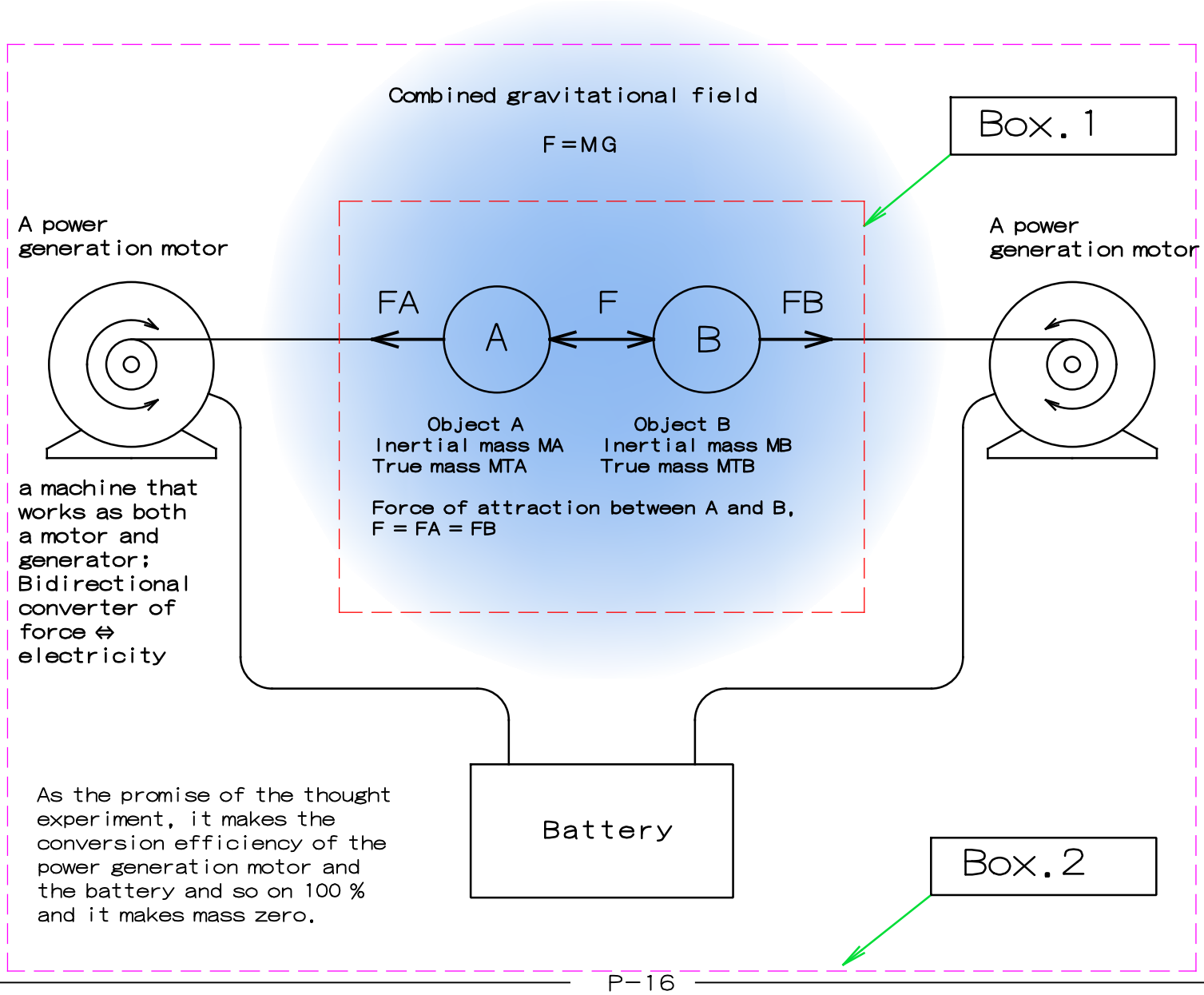
The Big Bang Theory (expanding universe theory) has considerable unreasonableness as it is forcibly fit to the observed facts. On the other hand, in this theory, there is no inconsistency in the basic story. This theory is in accordance with all the observed facts.

The item	The Big Bang Theory	My theory
Redshift of remote celestial bodies and their acceleration	A strange concept called dark energy is required to be introduced for explaining accelerated expansion.	It is a natural consequence due to the nature of the gravitational field.
Cosmic background radiation and its uniformity	To explain the uniformity, we have to include a superfluous hypothesis called inflation.	Since the farthest part of the universe is the event horizon of a black hole, it is natural that it is extremely uniform.
Emergence of giant black holes and clusters of galaxies during the early stages of the universe	Difficult to explain	Black holes and galaxies had already started to form in the high-temperature outer space, before the closure of cosmic space.
Elemental composition of the universe	Since elements were synthesized at a high temperature in a short period, almost no elements beyond Lithium could be formed	Though the temperature was high, space was extremely sparse, and hence, almost no elements beyond Lithium could be formed even over a long period.
The reason why the universe is dark and cold	Because it is expanding limitlessly. However, a speed beyond the speed of light must also be assumed.	Because it is enclosed in the event horizon of the cosmic black hole. Natural consequence
Theoretical structure	Needs unconfirmed theories. Needs singularity. The mass-energy conservation law is ignored.	The usual classical theories of physics can support the theory as a whole. There is no conflict with the existing laws of physics.

Thought experiment ① Dark Matter Proof of the Existence of Matter That Cannot be Seen and Has Gravity Effects

Summary of conclusions obtained by this thought experiment

In the case of a binding reaction that releases immense binding energy, the binding energy may be equal to the energy conversion value of the total mass M of two objects. In this case, when the binding energy is released, at first glance, the mass is lost.
A reaction of electrons with positrons is an example of this. However, the conclusion of this theory is not that matter ceases to exist, but that the property which gives rise to a gravitational field remains. A substantial quantity of such invisible matter exists in the cosmic space which has a significant gravitational effect on the entire universe, though it is difficult to detect as there is no inertial mass and hardly any interaction with matter.
The following figure is a thought experiment device (1) to perform experiments (annihilation experiments) between ordinary substances.
The law that is the prerequisite here is the law of conservation of mass → Regardless of what happens in the box 2, the mass in the box 2 does not change unless the mass enters from or exits to the outside.
As a result of the thought experiment, if the binding energy is very large as intended, the inertial mass in box 1 disappears. However, the true mass which gives rise to the gravitational field continues to exist as it is. Since the mass inside box 2 does not change, the lost inertial mass is moved to the battery. In other words, energy is the inertial mass.



The figure "Thought experiment device (1)" in the preceding paragraph is used to prove the identity of dark matter. Objects A and B are in accelerated motion in the combined gravitational field of the two objects.However, since they are tied with a string, the string is subject to stress caused by a tensile force. If the power generation motor is rotated by this tensile force, as A and B approach each other, the binding energy is stored in the battery as electric power.

Thinking Process in this Thought Experiment

(1) The emphasis is on the law of conservation of mass.Emergy need not be classified. In a black box,irrespective of the kind of reaction taking place, the inertial mass of the entire black box does not change as long as mass does not enter or exit. Also,the gravitational field created by the black box does not change.This probably is in accordance with the knowledge of physics.

(2) When the gravitational binding energy E of A and B are released to the battery,the inertial mass of A + B is reduced by $\delta M = E/C2$. The reduced portion increases the inertial mass of the battery by the same amount and satisfies the law of conservation of mass inside "Box2".

＊Conclusion:
Inertial mass (property) is associated with energy.
Energy has inertial mass.

(3) When the binding energy becomes extremely large, the inertial mass of A+B approaches zero. In the case of A = B, it may become completely zero. This process is reversible
(within the scope of common knowledge of physics) as long as the inertial mass is not zero.
In other words, as long as A + B is not zero, even if it approaches closest to zero, it returns to the originalinertial mass when A and B are pulled apart again by the power generation motor. The inertial mass of the battery that is discharged to rotate the motor returns to the original value, the inertial mass in "Box 2" does not change and the law of conservation of mass is satisfied.

In this case, since energy can be reversibly drawn by pulling A and B apart with the power generation motor from a state where the inertial mass of A and B is close to zero implie0s that a large force of attraction exists even if the mass of A and B approaches zero. If this is not the case,then energy cannot be extracted reversibly. In other words,the gravitational field continues to exist.

Thus, it can be concluded that even if the inertial mass of A and B decreases rapidly or becomes zero,the gravitational field will remain as it is. Even if the inertial mass of A and B becomes zero, A and B continue to exist.

(4) Here, the concept of "True mass" is introduced. According to this concept, the property of inertial mass does not exist but can create a gravitational field. When A and B lose their inertial mass, though they appear to have disappeared at first glance, they continue to exist, and the gravitational field and electric force created by them do not change. However, the electric forces are positive and negative, canceling out each other when combined, and there is no impact of the electric field on the outside. However, there is no cancellation in the case of gravity, and the gravitational force will be the sum of A and B.

Note: It turns out that "True mass" has another definition. Therefore, we have to use another word for this. Since true mass is also defined as gravitational mass, should we say "Quantum of gravity"? I do not know if the Japanese word can be appropriately translated into English.

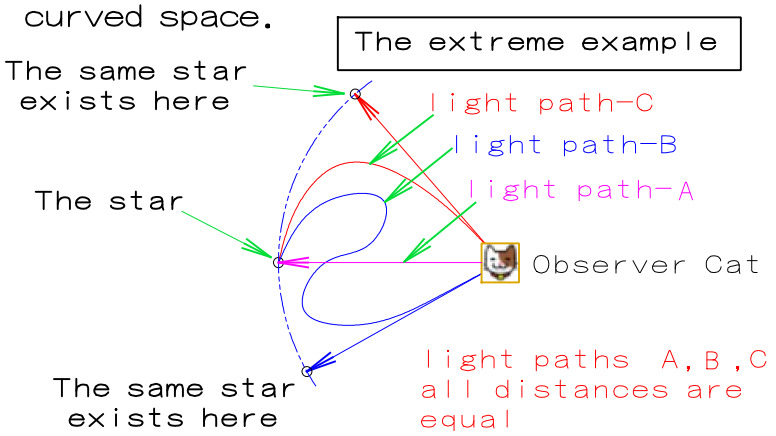
Summary of conclusions for Thought experiment (1)

◎The "Property of creating a gravitational field" and "Property of receiving acceleration in inertial and gravitational fields" of matter are different and can be separated. In this theory, these properties are classified as, "Property creating a gravitational field as 'True mass (quantum of gravity)'", and "Property of experiencing acceleration in inertial and gravitational fields" as 'Inertial mass'". Inertial mass and energy are essentially the same (convertible).Naturally, inertial mass = gravitational mass (strictly).

◎Even if the inertial mass of A and B is lost, A and B do not cease to exist.
True mass (quantum of gravity) continues to exist and the gravitational field associated with it also continues to exist. If matter whose mass has become zero can be given the amount of binding energy that was released, the matter will separate again and return to the original A and B. This is true not only for gravitational binding but electrical binding as well, and reactions between electrons and positrons, protons and antiprotons, can be cited as examples. These conjugates that have lost the inertial mass can be candidates for dark matter.These conjugates were formed in large quantities in outer space before the cosmic space closed.I think the above clarifies that lost mass is a candidate for dark matter. In the next section, we will further study and examine the behavior of lost mass. → Thought experiment device (2)

Reference: Principles adopted in this theory

◎ in general, according to the special relativity theory, light bends in a gravitational field. However, light travels straight through vacuum space. It appears to bend because space is curved. (Curved 3-D space) An addition to this interpretation is "Light passes through the shortest distance in curved space.



If there are multiple light paths between two points, they are all the shortest distances.
In other words, all distances are equal." "The space structure, in reality, is curved, and there are many light paths between two points. If you go straight along any light path, you arrive at the same point covering the same distance.

This is same as the curved Two-dimensional surface of the earth, where there are many straight lines (surface lines having the shortest distance) connecting the south and north poles and arriving at the same destination covering the same distance, irrespective of the path traveled.

◎ Law of conservation of mass. Irrespective of how matter changes in the black box, the inertial mass of that box and strength of the gravitational field produced by the inertial mass do not change. According to the conventional theory, for example, if electrons and positrons are annihilated inside this black box, it may be interpreted that the inertial mass or gravitational field will change, but it is probably wrong.

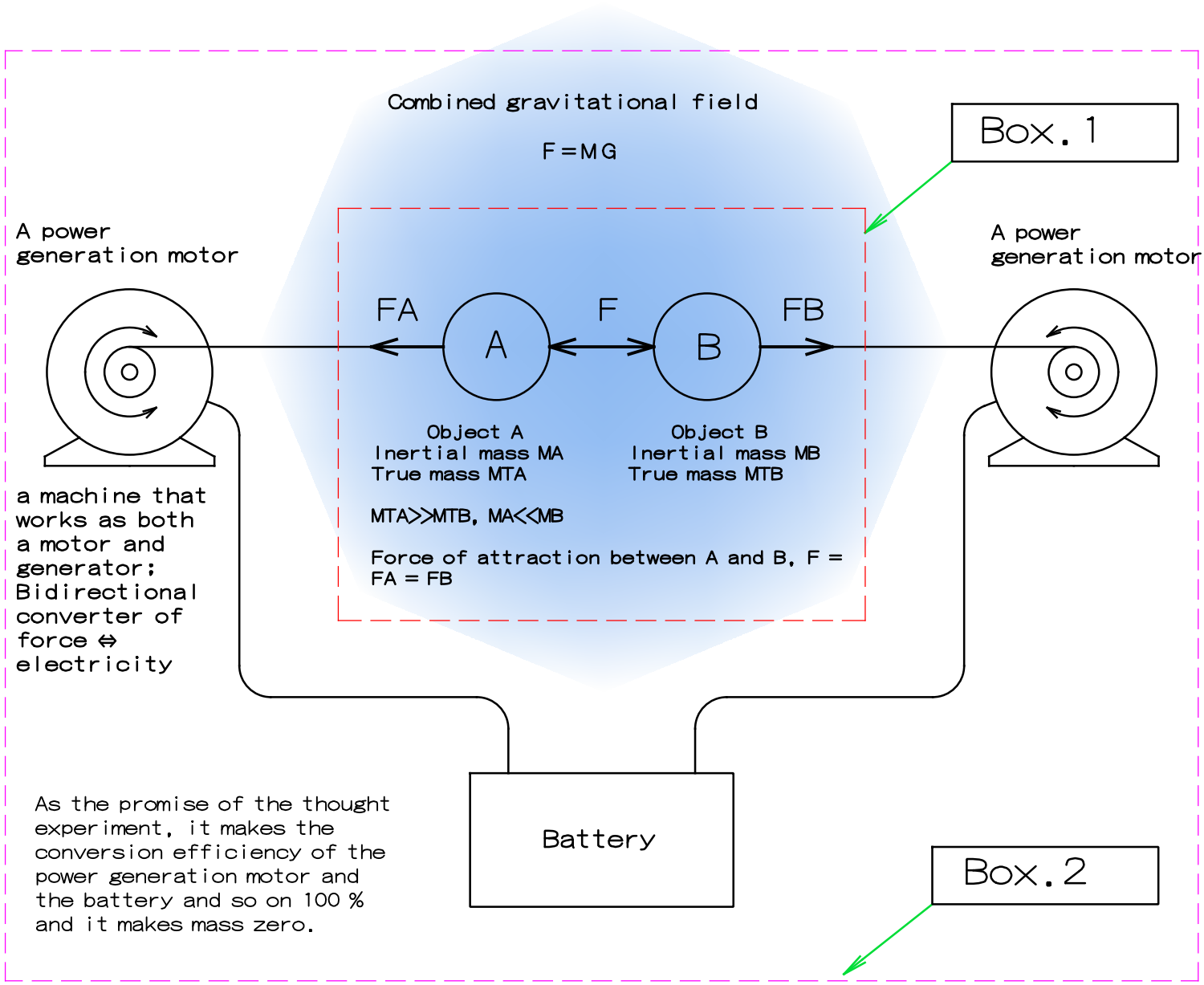
◎ Gravitational redshift. When you look at objects that are at a lower potential in a gravitational field, they appear red-shifted. This is because the light energy $E = h\nu$ is taken away while traveling uphill in a gravity gradient. When this happens, the frequency of light ν inevitably decreases, which causes time delay. → Time velocity is inversely proportional to the wavelength and directly proportional to the frequency. For example, when looking at the same light source, if person A observes it as 500 THz and person B observes it as 50 THz, one year of person A will be 10 years for person B. While person B ages ten years, person A ages only one year. In other words, those who are at the lower end of the gravity gradient grow old slowly.

◎ Event horizon. The event horizon is often said to lie at the Schwarzschild radius of the black hole, but this is not fixed.
The location varies depending on the observer. The place where the speed of light is required as the escape velocity to reach the observer is the event horizon. Since the event horizon of the black hole recedes as the observer in a fall approaches it, the observer never reaches the event horizon.

Thought experiment device (2) Consideration on the relationship between matter A deficient in inertial mass and normal matter B

Prerequisite law: The law of conservation of mass → Regardless of what happens in box 2, the mass does not change unless mass enters from or exits to the outside.

Overview → Matter that has lost inertial mass is less likely to show an interaction, which occurs between two objects with normal matter. However, if the mass of B is enormous (for example, galactic cosmic class), A and B may bind, in which case the true mass increases and the gravitational field becomes stronger.



Let GA be the gravitational acceleration at an arbitrary location in the gravitational field produced by A.
Similarly, let GB be the gravitational acceleration produced by B.

The force of attraction applied on B only by the gravitational field created by A is MB × GA (constant is omitted) in the leftward direction, and the same reaction force is also applied to A in the opposite direction.

Also, the force of attraction applied on A by the gravitational field created by B is MA × GB, and the same reaction force is applied to B in the opposite direction. As a result, the magnitude of forces applied on A and B is (MA × GB) + (MB × GA), which act in opposite directions.

Speaking in general, if the gravitational acceleration created by A at an arbitrary point C is GA, and the gravitational acceleration created by B at point C is GB, then the combined gravitational field is GA + GB, which is a three-dimensional vector.

Here, the assumed inertial mass of A is MA ≒ 0, and hence, MA ≪ MB. Since the true mass of A is enormous and the true mass of B is small, MTA ≫ MTB. The energy is taken out from A and B in the Thought Experiment Device (2).

Since the inertial mass of A is close to zero, A receives hardly any force of attraction due to the gravitational force of B, whereas B receives a large force of attraction due to A, and hence a large force of attraction is applied between A and B.

If both are tied with a string, as shown in the diagram, a large force is applied to the string.
If this force rotates the power generation motor, power is generated, and the battery is charged.

The inertial mass equivalent to the amount of the binding energy that is released disappears from box 1, and the inertial mass of the battery is increased by that amount. The inertial mass inside box 2 does not change.
A and B from which the binding energy is drawn are bound and the energy released must be supplied to separate them.

If the string snaps, and A and B become free in thought experiment device (2).

Since a large force is applied between A and B, A having almost zero inertial mass is mainly attracted.
Here, when A and B collide, the binding energy changes to thermal energy, etc., and is radiated in the form of light, etc. from the A–B conjugate, and the total inertial mass of A and B decreases. Since the radiated light etc. carries the reduced amount of inertial mass, even if the light passes through box 1, the inertial mass inside box 2 will not change if the light is confined within box 2.

If A and B do not collide, then they will pass by each other and move away, or both will rotate and stabilize. However, in this setting, since the inertial mass of A is close to zero, it is considered that conversion of the binding energy into kinetic energy by rotation is difficult.
Therefore, such binding is not likely.

It is considered that after passing each other, A and B will be restored and they will repeat the reciprocating motion. In any case, since the binding energy cannot be released unless the energy is lost due to the collision, etc., A and B will not bind.

If there are other objects C, D, E..., other than A and B, then there is a possibility that A and B may gravitate toward those objects, which may cause erratic movement. It is possible that objects which have lost the inertial mass (electron–positron conjugate, etc.) may exist while making irregular movements between many stars in the galactic microcosmos.

END

My blog
https://asada1223.blog.fc2.com/blog-entry-22.html

The web page for my business
https://www.fintech.co.jp

Address 34°45'01.3"N 135°03'32.1"E