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The Universe That Emerged and Developed in a Causal Manner

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ABSTRACT

The interpretation of the universe put forward in this series of research papers (30 papers in total) explains how the universe has emerged, developed, and will end in a causal and autonomous manner according to a single principle from start to finish. In other words, the emergence of all particles such as neutrinos, quarks, [the π-on group ($\boldsymbol{\pi^+, \pi^-, \pi^{\pm}, \pi^0}$) and the nucleon group ($\boldsymbol{p}$, $\boldsymbol{\bar{p}}$, $\boldsymbol{n}$, $\boldsymbol{\bar{n}}$)], and the 120 types of atomic nuclei as well as motive forces by which work physical forces such as "strong interaction," "weak interaction," the "electromagnetic force," and "gravity" are without exception the result of the causality between the 4 types of entities that existed in a single point at the emergence of the universe. Furthermore, this series of research papers will make clear how the universe has continuously developed according to causality and, in this way, has formed the entirety of today's universe, including all physical matter. This research will begin by proving the insight that there was nothing outside of the single point at the start of the universe. A consideration of the types of entities that existed in a single point at the start of the universe and of the causality between these entities will follow. If we assume that not even space existed outside of the universe, it is not possible for neutrinos and quarks to suddenly emerge, although the Standard Model advocates it is possible. As such, this research paper believes that the universe began by constructing space. That is, this series of research papers splits from the Standard Model right from the start of the universe.

Keywords: Emergence of the universe; Development of the universe; Big Bang Hypothesis; Causality; Anti-particles; Symmetry; sequential nature

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INTRODUCTION

All phenomena inherent to the universe, including its emergence, should have appropriate causes and should have resulted in a causal manner. Therefore, there is a strong demand for the formation of science or physics that attempt to clarify in a causal manner the emergence of the entirety of the universe. If we were in Newton's time, in which it was believed that this universe has remained still from its beginning and will continue to do so to its end, there would be no major mistake in the methodology of phenomenologically grasping the concept of the universe and mathematically proving this concept. However, since its emergence from a single point, the universe has continued to expand moment by moment and particles have continued to develop as follows: quarks → nucleons → atomic nuclei → elements and compounds → heavenly bodies (planets). Without discerning the motive forces and constituent materials of these items, it is impossible to give a fundamental clarification.

The development of the universe furthermore established a high-leveled structure of atomic nuclei made up of 8 layers of pairs in the sequence 2--8--8--18--18--32--32--2 by assembling quarks into the parts of protons and neutrons. It is not possible for this development organized in a sophisticated manner to be a random result. There is no room to doubt that it is the result of an unbroken chain of causality. However, the way of thinking of the Standard Model of current physics ignores items such as the motive forces, causality, concrete constituent materials, continuity, and autonomy of the development of the universe. The Standard

Model has attempted to independently clarify the basic principles of emergence such as the emergence theory of the universe, the elementary particles theory, and "strong interaction" and "weak interaction" phenomenologically. As such, the Standard Model has yet to even discern in a concrete manner what entities compose the materials of neutrinos and quarks, which are the fundamentals of physical matter. As such, we have decided to attempt to explain all the processes from the emergence of the universe to today by way of a single principle. We will do so with approximately 30 research papers-starting with this one that do not contradict each other. That is, this research will clarify the background behind the composition of this highly ordered universe where the countless heavenly bodies are controlled by "gravity": through what causality between entities the universe formed; how the extension of this causality led to the emergence of forces such as "strong interaction"[1], "weak interaction"[2], the "electromagnetic force," and "gravity;" how everything in the universe maintains symmetric properties as if it shares the same destiny.

SPACE WHEN THE ENTIRE UNIVERSE WAS CONTAINED WITHIN A SINGLE POINT

This universe has developed from its starting single point according to the law of causality. According to the Standard Model up to now, it is assumed that space existed prior to the occurrence of the explosion known as the "Big Bang"[3]. This is because without space, there would be nowhere for the neutrinos, quarks, etc. that emerged as a result of this explosion to go.

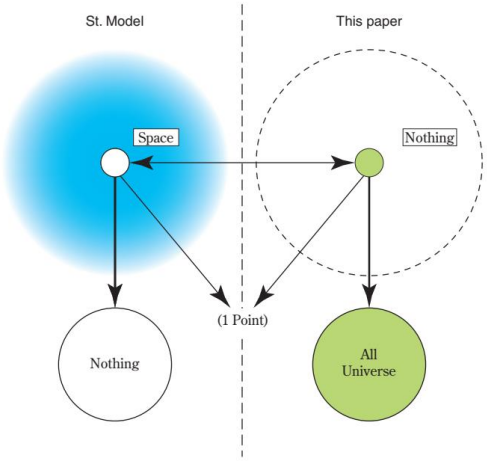


Fig. 1 The state of the single point immediately prior to the emergence of the universe Up to now, according to the Standard Model, the single point has been floating in space and the constituent materials of the universe have not existed within the single point. This research paper puts forward the ideas that space did not exist around the single point and that the constituent materials of the universe existed within the single point.

Even if we assume that when the universe existed as a single point it was floating in some sort of space and then the "Big Bang" occurred, assuming that the countless precursor particles that are the constituent materials of the universe were thrown to the space outside the universe (note, however, that it is not even possible for these particles to emerge), all the particles would be closed worlds, which would mean that the countless particles would have no causal relationships between them. Consequently, it would not have been possible for the universe to develop any further. From the fact that the current universe has been formed, we must believe that the single point immediately prior to the emergence of the universe was not floating in space but was rather surrounded by absolutely nothing (Fig. 1).

Furthermore, the Standard Model concludes that more than 10 types of elementary particles with different components such as neutrinos and quarks emerged together with the emergence of the universe. Yet, the Standard Model makes absolutely no attempt to clarify the basis under which this large number of types of elementary particles were formed from this single point in which no entities existed (Fig. 1). There was absolute nothingness not having even space around the universe (the single point). In addition, it is not possible to create something from nothing, so it must be believed that the constituent materials of the entirety of the universe were contained entirely within this single point. Therefore, we must believe that the universe condensed within a single point and the universe that exists on an infinite scale today both are composed of the same entities. Hence, to clarify the entirety of the universe, the most important thing to do is also that which must be done first: define the entities that existed in that single point (Fig. 1).

THE 4 ENTITIES THAT COMPOSE THE UNIVERSE

The universe's causality manifests between a pair of entities; an entity that induces causality and another entity that becomes the motive force. Furthermore, two sets of such an entity pair are essential for the universe’s causality to manifest. Space or space-time, which are existences taken for granted these days, did not exist at all when the universe existed in a single point, so we must believe that they were composed from some sort of materials and forces. "Heat" is the motive force that causes "space" to expand. "Heat" is a motive force that the higher the temperature (the density of "heat" at a given point) or the more compressed the "space," the more forcefully "space" is made to expand. Both "heat" and "space" can have a volume of zero and can expand infinitely. Therefore, the first things that existed in that single point were "space" and "heat." As the universe has expanded, time has passed. Time did not pass when the universe was in a single point. Therefore, immediately after the emergence of the universe, both the expansion and time passing (going straight on) began to move forward. "Time" is the main body of this passage of time. The universe has been formed only by phenomena. The universe started when phenomena

emerged, so phenomena were formed through the cooperation of "time" and "space." Just like "space" cannot expand by itself, "time" cannot move by itself. In the universe, varied physical matter exists together with space. As has been made obvious by atomic bombs, particles contain "energy." For the universe to develop, not 1 but 2 pairs of entities are essential. As such, it can be believed that the one other pair that composes the universe is "time" and "energy," which is also assumed to be the foundation of physical matter. Therefore, the motive force that causes "time" to move forward is "energy." At this point, it is assumed that the entities that existed when the universe was in a single point as well as the entities that compose the entirety of the universe today are the "time" and "energy" pair and the "space" and "heat" pair (Fig. 2).

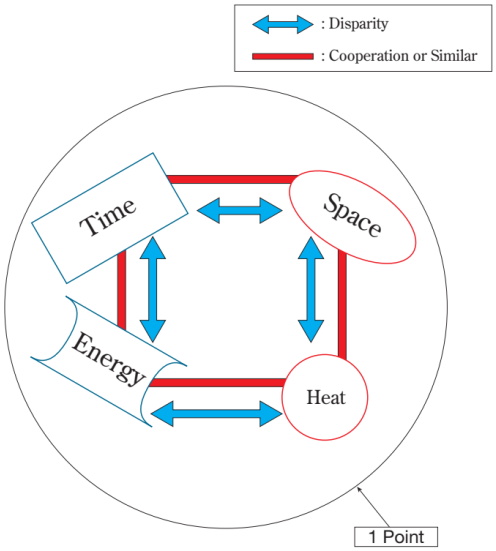


Fig. 2 The 4 types of entities that existed in the single point. We have assumed that in the single point, there existed 4 entities ("time", "space", "energy", and "heat") in limitless amounts and that had relationships of cooperation and confrontation between them.

Next, this research paper will verify that these 4 entities construct space, manifest the physical forces, and form everything from particles to the heavenly bodies. That is, this research paper will confirm that the composition of the entire universe was done by the "time" and "energy" pair and the "space" and "heat" pair. The universe has expanded from a single point to its current limitless scale due to the causality between the 4 entities listed above. "Time" and "space" are in confrontation on the point of their ways of moving; one goes straight on, the other expands. But they cooperate in the way that they both are materials for the formation of phenomena. "Heat" has a preference for movement, but "energy" has a preference for stillness. In this way, these two entities are in confrontation. However, they have the commonality of both being motive forces for "space" and "time." The environment for the "time" and "energy" pair is either still or moving and the environment for the "space" and "heat" pair is either small or large. In this way, these pairs are both in confrontation with and cooperate with each other, and this links them causally (Fig. 2).

IMMEDIATELY BEFORE THE EMERGENCE OF THE UNIVERSE

Immediately before the emergence of the universe, there were 4 types of entities that were concentrated in the single point: "time," "space," "energy," and "heat." When these 4 types of entities were contained in a single point, they all were infinite. These entities were contained in the single point only for an instant. When the universe is a single point, "heat" constantly has a preference for movement, so the repellent forces attempting to move are infinite. "Space" is forced to expand by receiving the infinite pressure of "heat," but "space" existed in the single point, so we must believe that it expanded equally in both the positive and negative directions. When "space" split to expand in both the positive and negative directions, "heat" entered in, which enabled a slight amount of movement. Let us call the infinite positive and negative spheres that each included "heat" "positive space" and "negative space" (Fig. 3).

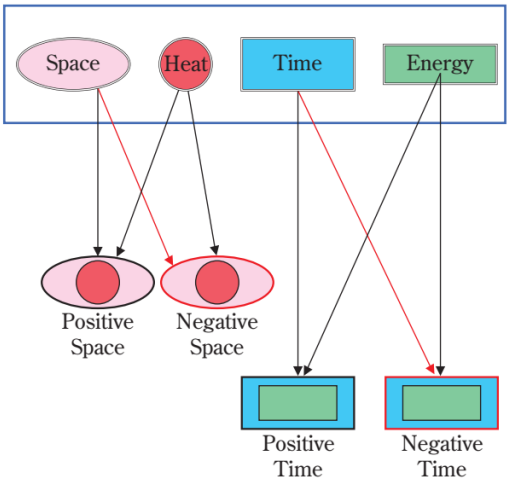


Fig. 3 Immediately before the emergence of the universe. In the universe, "heat" became the motive force that caused "space" to expand and "energy" became the motive force that caused "time" to move forward. This resulted in "space" splitting into positive and negative parts and combining with "heat" as well as "time" splitting into positive and negative parts and combining with "energy," leading to the emergence of "positive space," "negative space," "positive time," and "negative time."

When the universe develops, the 4 entities of "time," "space," "energy," and "heat" have mutual causal relationships in any and all cases, so if 1 pair act, another pair starts to act almost immediately. The instant that "space" began to expand with "heat" as its motive force, the other pair of "time" and

"energy" was forced to be linked. The instant that "space" began to expand, the universe entered a state of (minor) movement, which caused "energy," which has a preference for stillness, to exhibit a motive force in an attempt to maintain the still state. It is only possible to maintain a still state within "time," which exhibits linearity with no volume. Receiving the pressure of "energy," "time" split into positive and negative and moved forward slightly (exhibiting a force). The infinite "energy" entered therein to obtain a still state. Let us call the infinite positive and negative lines that each included "energy" "positive time" and "negative time" (Fig. 3). In this manner, the 4 entities that existed in a single point ("space," "heat"," "time," and "energy") became 4 other entities ("positive space," "negative space," "positive time," and "negative time") by way of the acting of the causality of the "fundamental development force" that the universe was originally furnished with. To form phenomena, the assumption is that "time" and "space" cooperate. However, the system of cooperation between "time" and "space" has not yet been established for the 4 entities ("positive space," "negative space," "positive time," and "negative time"). As such, this state is still immediately before the formation of the universe.

THE EMERGENCE OF THE UNIVERSE

When the universe was formed, "positive space" and “negative space” emerged due to the combination of "space" and "heat" and "positive time" and “negative time” emerged due to the combination of "time" and "energy." After this point, the universe has to form particles and expand to the limitless universe that exists today. However, it was not possible to create particles immediately. For particles to exist, space is essential, yet not even space existed at the start of the universe. Hence, the 4 entities starting with "time" had to act as the core in order to create space. The "fundamental development force of the universe," which is nothing less than the 4 entities starting with "time," exhibited force to create the 4 entities starting with "positive time." Thereafter, the 4 entities starting with "positive time" exhibited force (the "emergence force of the universe") to start developing the universe.

The "emergence force of the universe" is the universe's first force. The stage at which the 4 entities starting with "positive time" existed is an instant just after the universe existed as a single point. The scale of the universe was still incredibly small at the point when the 4 entities starting with "positive time" were all that existed. Therefore, the "heat" that existed within "positive space" and "negative space" became the motive force that caused positive and negative "space" to forcefully expand. Receiving the strong pressure of "heat," "positive space" and "negative space" worked to compose pre-space-time, which was the first space. It is not possible to develop the universe on an infinite scale with just the 1 pair of pre-space-time and neutrinos. It is essential that the universe has 1 more pair of phenomena (space-time and quarks). Therefore, it was not acceptable for the entirety of the 4 entities starting with "positive time" to be used completely as the materials of pre-space-time and neutrinos. In other words, half the amount of the 4 entities starting with "positive time" became the formative materials of pre-space-time and neutrinos. The universe initially existed in a single point, so all the compositional elements must be organized so as to total zero. Pre-space-time also composed positive and negative elements in equal quantities. Therefore, using "heat" as the motive force, "positive space" worked on the target of "positive time" to compose positive pre-space-time and "negative space" worked on the target of "negative time" to compose negative pre-space-time (Fig. 4).

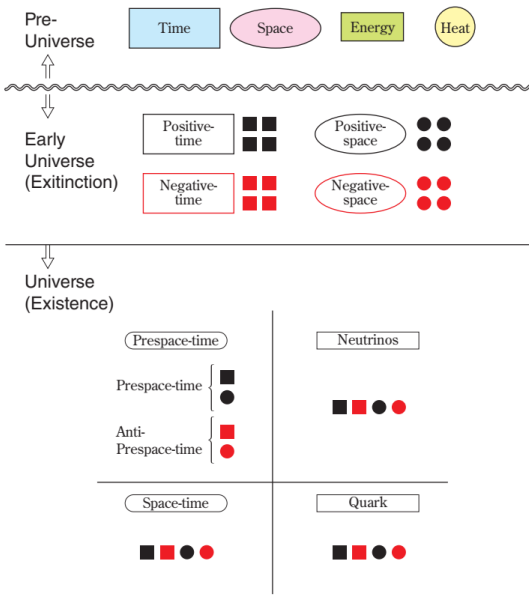


Fig. 4 The 4 elements that cause physical forces to act. The "emergence force of the universe," which is the first physical force, acted. In step 1 of this work, the first space (positive pre-space-time and negative pre-space-time) was formed.

"Positive space" and "positive time" as well as "negative space" and "negative time" expanded from their original states to be connected directly. Furthermore, even after this expansion stopped, "heat" became the motive force that caused positive and negative "space" to forcefully expand. On the other hand, the "energy" within "positive time" and "negative time" became the motive force that caused "time" to become still. As such, the contention between these two motive forces led to operations repeating endlessly.

THE FORMATION OF NEUTRINOS

The formation of the first space in the universe was, in the strictest meaning, the formation of the universe. In any and all stages of the universe, it develops by forming 2 pairs of factors that are mutually opposed. Among these pairs, 1 pair composed neutrinos with the same constituent materials as pre-space-time. The mutual causality between the 4 entities

starting with "positive time" that composed neutrinos is the work of step 2 of the "emergence force of the universe." "Positive space" and "negative space" led the formation of pre-space-time. However, "positive time," "negative time," and their motive force "energy" are what led the formation of neutrinos.

The entire universe entered a state of movement of pre-space-time due to pre-space-time being formed and a small space being constructed in the entire universe. This resulted in "energy," which has a preference for stillness, exhibiting motive force on "positive time" and "negative time" so as to enter a state of stillness. The 4 entities starting with "positive time," which hold a quarter of the number of entities of the entire universe and are the same amount as pre-space-time, participated in the formation of neutrinos. In forming space, it is only possible to arrange "time" and "space" in positive and positive as well as negative and negative combinations. However, for physical matter, in addition to the positive and positive as well as negative and negative combinations, mixed combinations of positive and negative as well as negative and positive are also possible.

First, "positive time" directly exhibited force (bonding) on "positive space" to form positive particles. Then, "positive time" exhibited force (bonding) on "negative space" to form positive and negative particles. Next, "negative time" directly exhibited force (bonding) on "negative space" to form negative particles. Lastly, "negative time" exhibited force on "positive space" to form negative and positive particles. Therefore, neutrinos formed in a combination of 2 pairs of 4 types (Fig. 5).

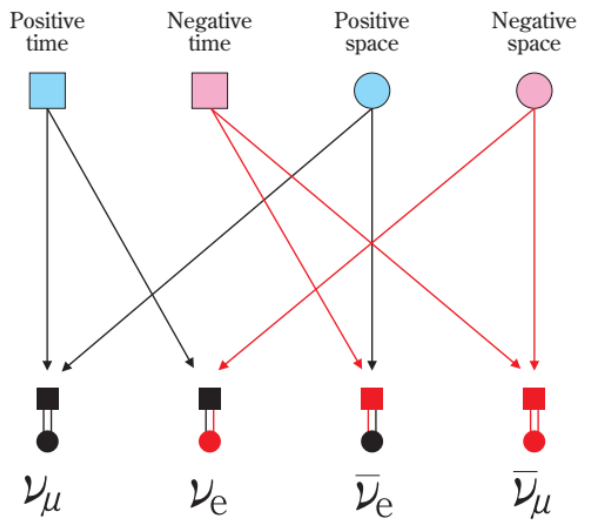


Fig. 5 The formation of the 2 pairs of neutrinos**.** As the work of step 2 of the "emergence force of the universe," 2 pairs of neutrinos $(\nu_\mu, \bar{\nu}_\mu, \nu_e, \bar{\nu}_e)$ were formed as the precursor particles corresponding to the first space, pre-space-time.

The correspondence to the currently known neutrinos will be inspected in later research papers [4] and [5]. However, the "positive space" and "positive time" as well as "negative space" and "negative time" combinations are the mediators of the "strong interaction" during the formation of protons and neutrons as well as the formation of antiprotons and anti-neutrons, so these combinations correspond to μ-neutrinos and anti-μ-neutrinos. Also, the "positive space" and "negative time" as well as "negative space" and "positive time" combinations are the mediators of the "strong interaction" during the formation of π-ons, so these combinations correspond to anti-electron neutrinos and electron neutrinos.

DISCUSSION

This research paper has made clear that the cosmology of current physics has 3 major contradictions regarding the emergence and development of the universe. First is the belief that space already existed when the "Big Bang" occurred. Second is the failure to assume that the constituent materials of the universe existed in the single point when the universe emerged. Third is the failure to assume the causality of the development of the universe.

Furthermore, if we assume that the single point of the universe when it emerged was floating in space, which would have been a structure outside of the universe, this space would have been a positive structure, so only positive particles should have emerged. Hence, it is not possible to explain the fact that neutrinos and quarks have emerged with corresponding antiparticles. This research paper has discerned that immediately before the emergence of the universe it existed in a single point with absolutely nothing surrounding it, not even space. This research paper has also discerned that the 4 entities ("time", "space", "energy", and "heat") existed in this single point. In contrast to the Standard Model, which does not use the background of causality, this research paper has been able to make clear that the actual emergence of the universe was as follows: pre-space-time, which was the first space, emerged due to the causality (the emergence force of the universe) of the 4 entities starting with "positive time" that existed in the single point, and then the neutrinos corresponding to pre-space-time were formed. The Standard Model believes that 3 pairs of neutrinos $(\nu_\mu/\bar{\nu}_\mu, \nu_e/\bar{\nu}_e, \nu_\tau/\bar{\nu}_\tau)$ emerged as a coincidence, but this research paper has made clear that only 2 pairs $(\nu_\mu/\bar{\nu}_\mu, \nu_e/\bar{\nu}_e)$ were formed in order to maintain the causality and consistency of the entire universe. We would like to believe that the universe was created and developed in this manner by way of the 4 entities that existed in the single point.

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