The Big Bang and the Establishment of Cosmic Order

Authors: Ji Yongchen, Ji Yongchen

Date: 2025-08-19T00:00:00+00:00

Abstract

[Objective] Establish a cosmological theory, explaining the cause of the Big Bang and the process by which cosmic order is established.

[Methods] Through new concepts of atomic deformation and material static state, explain the cause of the Big Bang; through the theory of stepwise explosions and a hierarchical gravitational system, elaborate on the rationality of the existing cosmic structure.

[Results] The Big Bang can occur repeatedly; the universe, galaxies, and stars are born simultaneously; the universe is not expanding but may contract; stars do not evolve into black holes after death.

[Limitations] A. This paper can only conduct theoretical research; calculations of celestial gravitational systems are needed to prove the rationality of the concepts.

Full Text

The Big Bang and the Establishment of Cosmic Order

Ji Yongchen
(Liaoning, Chaoyang 122000, China)

Abstract

[Purpose] To establish a theoretical framework for celestial bodies in the universe and elaborate on the causes of the Big Bang and the process by which cosmic order was established.
[Method] By introducing novel concepts of atomic deformation and the static state of matter, we explain the cause of the Big Bang. Additionally, through the theory of hierarchical explosions and the graded gravitational system, we elucidate the rationality underlying the current structure of the universe.

[**Result**] The Big Bang could potentially recur, with the universe, galaxies, and stars being born simultaneously. Rather than expanding, the universe may only contract, and dead stars do not evolve into black holes at all.
[**Limitations**] This paper is limited to theoretical exploration, and calculations of celestial gravitational systems are required to prove the rationality of its general concepts.

Keywords: Big Bang; gravitational system; celestial theory; cosmic structure
Classification Number: P1

Author: Ji Yongchen, Male, Engineer, 1498041230@qq.com

1.1 Cosmic View and Its Basis Points

(1) Cosmic View and Its Formation Process

The universe broadly refers to matter and spacetime. A cosmic view represents humanity' s empirical feedback regarding external matter and spacetime, as well as the cognitive methodology built upon this feedback. The formation of a cosmic view is a cumulative process. Human understanding of external matter and spacetime depends on human vision, and both microscopic and macroscopic concepts arise from how human sight registers in the brain. These registrations, accumulated over long periods, form humanity' s cosmic view.

Human cosmic views can propagate horizontally and be inherited vertically. Horizontal propagation refers to intercommunication among people, while vertical inheritance represents the iterative process of brain structure evolution. Human understanding of external matter and spacetime depends not only on human vision but also on the basis point from which humanity observes external matter and spacetime.

(2) Distinction Between Worldview and Cosmic View

A worldview refers to analyzing matters from particular positions and time perspectives, representing human judgments and reactions to phenomena. It constitutes fundamental human perspectives and viewpoints about the world. The distinction between worldview and cosmic view lies in their origins: worldviews emerge from philosophy with broader coverage, encompassing matter, time, humanity, and human society, belonging to the humanities domain. Cosmic views arise from natural science, with research objects limited to matter and time.

(3) Broad and Narrow Cosmic Views

A broad cosmic view encompasses the entirety of humanity' s external world, while a narrow cosmic view is an astrophysical concept confined to the world beyond Earth. The research object of this paper is extraterrestrial celestial bodies, and unless otherwise specified, it refers to the narrow cosmic view.

(4) Cosmic View Basis Point and Its Significance

The cosmic view basis point refers to the position from which humans observe the universe. Different basis points yield different fields of vision, leading to different cognitive results about the external world. Humans can understand the universe through tools: microscopes for the microscopic world, telescopes for distant stars, aerial remote sensing for continents and oceans, and interstellar spacecraft for Earth. All these represent changes in the observation basis point, each revolutionizing previous understandings and triggering technological revolutions.

The concept of cosmic view basis points has profound implications for humanity. Human cosmic views form based on mature feedback from human vision in the brain. Human cognition of space, time, speed, and energy has become deeply ingrained. Although modern technology has maximally altered our cosmic view basis points, we still cannot truly understand worlds beyond human perception. If bacteria and viruses possess life, they can never comprehend humans; humanity faces the universe similarly. We can imagine that beyond the universe, other life forms might exist with heights and breadths unattainable by humans, whose worlds we may never understand. However, these considerations fall outside astrophysics research.

1.2 Current Research Status on Cosmic Origin

(1) Major Theoretical Systems on Cosmic Origin

Cosmic origin is an extremely complex question because the universe is a material world in constant motion and development. For millennia, scientists have continuously explored when and how the universe formed. Although numerous theories and doctrines address cosmic origin, three major influential theories stand out from a scientific perspective.

First, in 1543, Polish astronomer Copernicus published *De revolutionibus orbium coelestium*, comprehensively proposing the heliocentric theory. This system considered the sun as the center of the planetary system, with all planets revolving around it. Earth was also a planet, rotating like a top on its axis while orbiting the sun with other planets. Although heliocentrism has significant limitations today, its historical contribution is profound—not merely replacing geocentrism but symbolizing science' s triumph over religious authority. Moreover, heliocentrism triggered a worldwide astronomical observation boom, promoting rapid scientific and technological advancement. Its main contribution lay in fostering the birth of modern astronomy.

Second, the Big Bang theory. In 1929, astronomer Hubble announced a shocking discovery that largely led to the conclusion: all extragalactic systems are receding from us, meaning the universe is expanding at high speed. This discovery led some astronomers to consider that since the universe is expanding, there must be a starting point for this expansion. Astronomer Lemaître proposed that the present universe resulted from the explosion of a "primeval atom," the predecessor of Big Bang theory. American astronomer Gamow accepted and developed Lemaître' s ideas, formally proposing the Big Bang theory in 1948. Gamow argued that the universe initially was an extremely hot, dense primordial fireball composed of fundamental particles. According to modern physics, this fireball must have expanded rapidly, its evolution resembling a massive explosion. Due to rapid expansion, cosmic density and temperature continuously decreased, forming chemical elements during this process, then gaseous substances composed of atoms and molecules, which gradually condensed into nebulae, finally producing various celestial bodies from nebulae to become the present universe.

This theory sounds bizarre and incredible to most people. In the scientific community, due to lack of strong observational evidence, it did not receive universal response when first introduced. However, in 1965, the discovery of cosmic background radiation revived Big Bang theory. The theory had predicted that the universe should still contain residual heat from the primordial fireball everywhere, manifesting as background radiation from all directions. Remarkably, Gamow' s predicted residual temperature matched the cosmic background radiation temperature exactly. Additionally, improved astronomical data increased the calculated age of cosmic expansion from 5 billion to 10-20 billion years, which aligns with the ages of the oldest celestial bodies discovered in astrophysics research.

Since Big Bang theory explains more cosmic observations better than other theories, it increasingly demonstrates its vitality. Most astronomers now accept its basic concepts, and many previously unexplainable problems are gradually being resolved. It is the most influential and promising cosmic theory. Big Bang theory primarily explains the universe' s formation process.

Third, the nebular hypothesis. How the solar system formed remains a question without completely satisfactory answers. Numerous theories have been proposed, with the nebular hypothesis being the most astronomically valued. Initially proposed by German philosopher Kant and French astronomer Laplace, their similar content led to the collective term Kant-Laplace nebular hypothesis. Early nebular theory suggested the solar system formed from a contracting nebula, first forming the sun, then residual nebular material further contracting to form planets. However, Kant-Laplace nebular hypothesis only preliminarily explained solar system origin, with many observational facts difficult to explain, leaving it in a predicament for a long time.

Until this century, with advances in modern astronomy and physics, particularly the maturation of stellar evolution theory in recent decades, the nebular hypothesis has regained new vitality. Modern observations prove stars form from nebulae, and solar system formation is not a unique, accidental phenomenon in the universe but a universal, inevitable result. Additionally, many new discoveries about the solar system strongly support nebular theory. Modern nebular theory posits that the solar system formed from a dense nebula cloud in the Milky Way. This cloud rotated around the galactic center, and when passing through spiral arms, it was compressed, increasing density. When reaching certain density, the nebula gradually contracted under its own gravity. During contraction, the central portion' s internal temperature increased, finally forming the primitive sun. When the primitive sun' s core temperature reached 7 million degrees Celsius, hydrogen fusion into helium ignited, and the sun was born. On the other hand, as nebular volume decreased, rotation accelerated, centrifugal force increased, gradually forming a nebular disk near the equatorial plane. Materials on the nebular disk, through accretion and merging processes, finally evolved into planets and other small celestial bodies.

(2) Problems in Existing Cosmic Origin Theories

Most existing cosmic origin theories evade the question of cosmic origin. Many related research theories remain at the hypothesis stage, not yet upgraded to theoretical processes, and cannot connect with each other. The greatest flaw is that these so-called theories can only explain certain stages of cosmic formation, not the complete process. Specifically: first, Big Bang theory cannot explain cosmic origin using a single starting point; second, Big Bang theory fails to clarify the explosion process and cosmic order establishment; third, nebular hypothesis remains a hypothesis without involving specific physical processes; and fourth, cosmic formation processes contradict stellar formation processes.

1.3 Research Direction Choices for Cosmic Origin

(1) Direction Selection for Cosmic Origin Research

Since the universe exists in reality, we can never fully understand where the universe came from or when it was born—these are philosophical questions. Therefore, we leave cosmic origin questions to philosophers. Astrophysicists studying cosmic origin can focus on how the universe formed, particularly how cosmic operating order was established. Thus, the research focus becomes studying cosmic formation laws and operating order.

(2) Astrophysicists' Definition of the Universe

The universe possesses relativity. From a philosophical perspective, the universe is infinite. What modern astronomy can observe is only part of the whole universe, with countless similar cosmic centers existing beyond. Our research is limited to the universe where Earth resides. Even analyzing cosmic operating order reveals relativity because, according to physics principles, an object cannot suspend in empty space without external force control. Current cosmic order confirms that galaxies and galaxy clusters orbit cosmic centers, implying cosmic centers also suspend in empty space. We can thus conclude that cosmic centers must be controlled by enormous external forces—meaning more mysterious worlds exist beyond our defined universe. Therefore, the universe is indeed a relative concept, merely a complete unit of our research world.

The universe is a system of the material world, a gravitational system rotating around a cosmic center, composed of a massive cosmic center, numerous star clusters (galaxies), and nebulae. The cosmic center is an extremely massive celestial body. Due to extremely high density, it releases no particles externally. Humans cannot directly determine its position through observation, only through calculation. The cosmic center is a massive celestial body that, due to lack of self-rotation, presents an irregular gravitational system. Star cluster or galaxy trajectories are not on the same plane, with collision possibilities between them.

Since the universe is a gravitational system rotating around a cosmic center, cosmic scope is limited to the effective control range of cosmic center gravity over the smallest particles—a sphere with the cosmic center as its center. Given Earth' s possible location at the universe' s edge, we cannot exclude that human astronomical records contain celestial bodies from other universes—Hubble volumes may contain other cosmic worlds. Although the author believes other worlds exist beyond our universe, we must make a trade-off, defining cosmic scope by ignoring other worlds' existence. Thus, astrophysics-defined universe and cosmic center are relative concepts.

(3) Time and Universe' s Existence Duration

Time is an abstract concept representing the continuity and sequence of material motion and change, containing both moment and duration concepts. According to general relativity, cosmic time has a starting point beginning with the Big Bang—this is the time singularity. The time singularity has no "before" ; discussing time before it is meaningless. Matter and spacetime coexist—where matter exists, time has meaning.

Philosophically, the universe' s existence duration is infinite. Astrophysically, we set a time singularity starting from this Big Bang. The universe before this Big Bang was completely destroyed by it, making analysis unnecessary and impossible. Current astrophysics research claiming the universe has existed for 15 billion years, the sun for 5 billion years, and Earth for 4.6 billion years is completely wrong. According to our research, the Big Bang is a continuous process where universe, galaxies, stars, and Earth were born simultaneously. How long the universe and celestial objects have existed remains unknown. If astrophysicists claim the universe has existed for 15 billion years credibly, then all are 15 billion years. One point must be clear: universe, solar system, and Earth were born almost simultaneously!

2.1 Basic Principles of Physics

(1) Matter and Its Properties

Matter constitutes all objects and fields in the universe. Matter exists in countless forms and varieties: gaseous, liquid, or solid states; elements, compounds, or mixtures; metals and non-metals; minerals and alloys; inorganic and organic substances; naturally occurring and artificially synthesized materials; lifeless and living matter; physical entities and field matter. Despite their variety, all matter shares characteristics: observability or theoretical predictability, and possession of mass and energy.

For astrophysics research needs, we classify matter' s physical states into five existence forms: gaseous, liquid, solid, molten, and static states. Gaseous states have neither fixed volume nor shape, with molecules moving freely to fill any container. Liquid states have volume but no fixed shape, with loosely bound molecules that can be poured into containers for volume measurement. Solid states have both shape and volume, with tightly bound molecules. Molten states refer to high-temperature softened conditions formed inside supermassive celestial bodies under high temperature and pressure. Static state is a new concept referring to ultra-high temperature and pressure inside supermassive celestial bodies causing collapse of space between atomic nuclei and electrons, leaving both in static states.

The law of mass conservation states that in chemical reactions, the total mass of reactants equals the total mass of products. In any isolated system, regardless of changes or processes, total mass remains constant. No changes, including chemical or nuclear reactions, can eliminate matter—only change its form or structure. This law is also called the law of indestructibility of matter.

The law of energy conservation states that energy cannot be created or destroyed, only transformed from one form to another or transferred between objects, with total energy remaining constant. A system' s total energy change equals energy input or output. Total energy comprises mechanical energy, thermal energy, and all internal energy forms except thermal energy.

Mass-energy equivalence represents the quantitative relationship between mass and energy. In classical physics, mass and energy are distinct concepts without definite equivalence—objects of certain mass can have different energy, with limited energy concepts like kinetic and potential energy. In special relativity, the energy concept expands, establishing definite mass-energy equivalence: for an object with mass m, corresponding energy is $E=mc^2$.

(2) Matter State Transformation and Thermal Energy Relationship

In astrophysics, matter has five states: gaseous, liquid, solid, molten, and static. A substance' s state relates to both its original condition and the pressure it bears. When pressure increases within certain ranges, substance volume decreases under equivalent states while internal thermal energy increases. When pressure exceeds certain limits, matter undergoes state transformation, releasing greater thermal energy.

Physical deformation refers to volume changes without state alteration. When pressure increases, matter’ s temperature rises due to increased internal thermal energy. Among deformations, physical deformation releases minimal thermal energy. Chemical deformation involves chemical reactions and structural changes. When pressure and temperature rise sufficiently, nuclear fusion occurs, producing new substances. Hydrogen nuclear fusion is just one type—sufficient pressure and temperature can cause thermonuclear reactions in other heavy nuclei, releasing higher-level thermal energy. Chemical deformation releases substantial thermal energy, though still incomparable to atomic deformation.

Atomic deformation refers to collapse of space between atomic nuclei and electrons, disappearance of chemical properties, and matter returning to its most primitive form. We define this process as atomic deformation. Among all deformations, atomic deformation releases maximum thermal energy. Although a new concept, atomic deformation should not be unfamiliar—it is the phenomenon previously discussed in astronomy as black hole formation, which we now elevate to theoretical status with astrophysical concepts. Since triggering atomic deformation requires extremely high conditions, only the cosmic center’ s enormous mass can trigger it.

When matter bears pressure and temperature exceeding critical values, electronic deformation occurs, compressing the vast space between atomic nuclei and electrons, converting electrons’ kinetic energy into thermal energy release. Atomic deformation’ s direct consequences are massive thermal energy release and geometric-level volume reduction. Once triggered, atomic deformation causes enormous thermal energy release, rapidly increasing internal temperature and pressure, causing the deformation state to spread rapidly and form a chain reaction, with internal thermal stress soaring beyond external pressure constraints, triggering explosion. Atomic deformation inevitably triggers the Big Bang. The triggering conditions are extremely high, achievable only by the cosmic center’ s enormous mass.

2.1.3 Celestial Mechanics and Force Analysis

Newton’ s law of universal gravitation states that any two objects in nature attract each other, with gravitational force proportional to the product of their masses and inversely proportional to the square of their distance: F=G$m1$m2/r2. Centrifugal force is a virtual force representing inertia, causing rotating objects to move away from their rotation center: F=a$m=\{[4(\pi\hat{}2)r]/T\hat{}2\}$m. Self-gravity is the attraction generated by massive celestial bodies due to their own mass, always directed vertically downward. An object’ s gravitational force is proportional to its mass.

Massive celestial bodies in the universe operate within their respective gravitational systems, bearing pressure including gravity from their own mass and external gravitational forces, with internal stress mainly being volume expansion caused by internal thermal energy accumulation.

2.1.4 Temperature and Absolute Temperature

Temperature measures object hotness/coldness; microscopically, it represents the intensity of molecular thermal motion. From molecular kinetic theory, temperature signifies the average kinetic energy of object molecules—a collective manifestation of molecular thermal motion with statistical significance. Absolute temperature, also called thermodynamic temperature, is a fundamental physical quantity in the International System of Units. Absolute zero refers to 0K, corresponding to -273.15°C.

Explaining absolute temperature is cumbersome and unnecessary for Big Bang research. Simply understood: since temperature describes molecular motion intensity, scenarios without molecular activity have no temperature. Where is there no molecular activity? Cosmic vacuum states have no molecular activity, so cosmic vacuum temperature is 0K. However, space is not absolute vacuum —nebulae exist everywhere, at least containing thin hydrogen or particles, so cosmic space is not absolute zero. Cosmic microwave background radiation temperature is -270.15°C, the thermal radiation left by the Big Bang filling entire cosmic space, reflecting the universe' s condition at 380,000 years old, with a value of 3K near absolute zero. Interstellar dust temperature can reach as low as -260°C in cold cosmic space.

Heat transfer, or heat transmission, occurs spontaneously from high to low temperature areas whenever temperature differences exist within or between objects. Among factors affecting heat transfer, vacuum is the best insulator.

2.2.1 Celestial Bodies and Their Classification

Celestial bodies are collective terms for all cosmic objects, including cosmic centers, black holes, galaxies, stars, planets, interstellar matter, nebulae, dust, and particles. Classification varies by research purpose. For Big Bang research needs, we adopt a new classification standard in astrophysics: dividing celestial bodies into "hot celestial bodies" and "spatial matter" based on internal thermal energy accumulation levels.

Hot celestial bodies are massive objects whose internal thermal energy accumulation, under combined self-gravity and external gravity, sufficiently softens internal matter to achieve spherical shape. Spatial matter encompasses all celestial bodies except hot celestial bodies. This classification standard based on internal thermal energy accumulation is a bold innovation, allowing conversion of astrophysical concepts into thermodynamic concepts. Its main features are: first, few celestial bodies meet hot celestial body standards, facilitating focused research; second, hot celestial body research focuses on internal temperature increase processes; third, spatial matter research focuses on internal temperature decrease processes.

2.2.2 Hot Celestial Bodies and Their Classification

Hot celestial bodies specifically refer to massive spherical objects that can achieve spherical shape through internal thermal energy accumulation under combined self-gravity and external gravity. Classification by mass and internal energy levels includes cosmic center, black hole, stellar core, star, hot planet, and cold planet.

The cosmic center has enormous mass, gravity, and internal thermal energy, releasing no particles externally. It neither emits light nor particles, representing a dark center. Its internal temperature and pressure are extreme enough to trigger atomic deformation. Under current cosmic order, the cosmic center is at the critical state of atomic deformation. Once this critical point is broken, atomic deformation continues, releasing high-intensity thermal energy and triggering the Big Bang. Humans cannot observe or measure the cosmic center, only calculate its position.

Black holes are celestial bodies formed from massive molten matter separated during the Big Bang, the largest 单体 (or combination) orbiting the cosmic center. Their mass and gravity are one level lower than the cosmic center but still strong enough to prevent any particle release. Thus, black holes emit neither light nor radiation. Their internal temperature and pressure are insufficient to trigger atomic deformation but sufficient for chemical deformation. Theoretically, black holes cannot cause Big Bangs. Humans cannot observe or measure black holes but can calculate their positions. We predict a real black hole exists at our galaxy cluster’ s center.

Stellar cores are galaxy cores and residual parts from secondary explosions of massive static matter separated during the Big Bang. Their mass and gravity are another level lower than black holes. Internal temperature and pressure are sufficient to trigger internal chemical deformation and gas nuclear fusion, but massive pressure prevents large-scale light and heat particle emission like stars. Stellar cores are unobservable but measurable, with the Milky Way’ s galactic center only confirmed after radio telescope development.

Stars are plasma celestial bodies composed of luminous spheres, residual parts from tertiary explosions of massive static matter separated during secondary Big Bang explosions. Their mass and gravity are another level lower than stellar cores. Star systems attach to galaxies or other supermassive celestial bodies.

Stars are gaseous bodies mainly composed of hydrogen and helium, with internal temperature and pressure sufficient to trigger gas nuclear fusion and large-scale light and heat particle emission. Stars are the universe' s only luminous objects, such as the sun. Stars are key nodes constituting galaxies and the most easily observable celestial bodies.

Hot planets are massive planetary bodies attached to stars or other massive objects, with mass and gravity another level lower than stars. Internal temperature and pressure can only produce physical deformation. Compared to stars, hot planets emit no light or heat; compared to cold planets, they have frequent volcanic activity, making some hot planetary crust material compositions extremely complex. Representatives include Earth and Jupiter.

Cold planets are massive planetary bodies attached to stars or other massive objects, with mass and gravity another level lower than stars. Internal temperature and pressure can only produce physical deformation. The only difference from hot planets is insufficient internal thermal energy accumulation, lacking volcanic activity, with crust material compositions remaining primitive. Representatives include Neptune and the Moon.

2.2.3 State of Spatial Matter

Spatial matter encompasses all matter in the universe except hot celestial bodies. Influenced by cosmic space' s low temperature, spatial matter has only heat conduction, no thermal motion. Spatial matter can be classified by form into larger asteroids, solid tangible matter, icy tangible matter, free-state elements, and particles.

Asteroids refer to relatively massive spatial matter (with length, width, and height exceeding hundreds of meters) with fixed orbits, characterized mainly by irregular shapes. Due to small mass and gravity, internal pressure is insufficient, with low molecular density. Internally generated thermal energy is difficult to accumulate, with low crust temperatures, so most asteroids have solid or icy external matter.

Solid tangible matter refers to smaller tangible matter than asteroids, generally located within their gravitational system's internal region, with stronger particle radiation preventing icy surface matter. Icy tangible matter refers to smaller tangible matter than asteroids, generally located at their gravitational system' s edge, with weaker particle radiation resulting in mainly icy surfaces.

Free-state elements are the main form of nebulae or Oort clouds. Since heavier elements experience greater forces and aggregate, they generally exist as icy tangible matter. Only hydrogen, being light, mostly exists in single-element free states. Nebulae or Oort cloud matter distribution is extremely thin, with main parts approaching absolute temperature, and free-state element temperatures below critical points and melting points. Since hydrogen exists as single atoms without solid, liquid, or gas states.

Particles refer to the smallest material components that can exist freely. Particles possess energy, with stars releasing the most particles. Unless colliding and merging with other matter, particles continue moving through the universe.

2.3 Cosmic Structure and Composition

(1) Cosmic Structure

When analyzing cosmic structure with the cosmic view basis point set at the cosmic center, cosmic structure can be simplified further, using rotation around the cosmic center as the standard for cosmic composition. Among celestial bodies orbiting the cosmic center, there are large-scale gravitational systems, independently operating massive celestial bodies, and boundless nebulae.

(2) Cosmic Composition

Cosmic structure comprises three components: the cosmic center at the core, occupying an absolute proportion of cosmic mass; gravitational systems and independent celestial bodies orbiting the cosmic center at high speed; and nebulae orbiting the cosmic center slowly.

The cosmic center has enormous mass, occupying over 99% of total cosmic mass. Its immense gravity is the power source for all celestial motion in cosmic space. Internal temperature and pressure are extremely high, with core material bearing enormous pressure approaching atomic deformation' s critical state. If struck by massive matter, it could trigger a chain reaction causing the Big Bang.

Whether the cosmic center experiences forces from beyond the universe or orbits other mass centers is unknown. Philosophically, this certainly exists. Scientifically, since the cosmic center is in empty space, external forces must exist. However, for simplification, we assume the cosmic center is unaffected by other external forces and has no displacement or motion.

Independently operating massive celestial bodies include black holes, stars, or planets formed during the Big Bang' s early stage. Separated from the cosmic center, they form independent systems and, without intersecting other gravitational systems during long-term operation, maintain primitive states.

Nebulae occupy cosmic space' s main body, with vast and profound scope, composed of small celestial bodies, dust, gas, and particles dispersed during the Big Bang. Through accretion disk effects during black hole, star, galaxy, and galaxy cluster formation, nebulae contain countless hidden voids. Nebulae and Oort clouds are both Big Bang early products, differing only in their force systems.

2.4 Gravitational Systems and Their Hierarchy

(1) Gravitational System Concept and Characteristics

A gravitational system is a new astrophysical concept: a celestial system formed around an ultra-massive celestial core under its gravitational influence, with all material having centripetal tendencies. A gravitational system can contain lower-level gravitational systems, but these are constrained by higher-level systems. Gravitational systems have clear boundaries: when a system' s gravity cannot cause low-mass matter to move centripetally, or when other gravitational systems' effects surpass it, this critical point marks the system' s boundary.

(2) Hierarchical Gravitational Systems

Level 1: Cosmic Gravitational System
The cosmic gravitational system is the highest level, composed of the cosmic center, galaxy clusters (or galaxies or independent celestial bodies) orbiting it, and nebulae orbiting it. The cosmic center concentrates the vast majority of cosmic matter, an unobservable dark world and the power source for all celestial motion. Celestial bodies orbiting the cosmic center include galaxy clusters, individual galaxies, solitary black holes, and planets. These can be considered to include numerous Level 2 and Level 3 gravitational systems, independently operating Level 4 systems, black holes, and other massive celestial bodies.

Since the cosmic center does not rotate, galaxies (galaxy clusters) orbiting it are in disordered states with individual orbits, having relatively high collision probabilities. Nebulae occupy cosmic space' s main body, with vast scope, composed of small celestial bodies, dust, gas, and particles dispersed during the Big Bang. Through accretion disk effects during galaxy and star formation, nebulae contain countless hidden voids. Nebulae form a massive system orbiting the cosmic center. Although lacking the cosmic center' s rotation effect, through billions of years of collision and assimilation, they still operate in disk form. Nebulae exclude Oort clouds affected by galactic gravity.

Level 2: Galaxy Cluster Gravitational System
Galaxy cluster gravitational systems are secondary levels composed of black holes and galaxies orbiting them. Black holes are massive celestial bodies separated during the Big Bang, the largest 单体 orbiting the cosmic center. Unlike stellar cores, they did not explode and thus have no 附属 systems like galactic disks, leaving a vacuum zone around them. Although black hole mass and gravity are one level lower than the cosmic center, their gravity is strong enough to incorporate passing galaxies into their sphere of influence, altering galaxies' inherent orbits and forming galaxy clusters centered on them. However, not all galaxies passing black holes become their "satellites" —many are swallowed.

Only a small fraction of black holes in the universe can form their own galaxy clusters. Galaxies are gravitational systems containing stars, gas, cosmic dust, and dark matter, bound by stellar core gravity. Galaxy formation results from secondary Big Bang explosions, unrelated to black holes. Galaxy cluster formation is purely accidental. In cosmic gravitational systems, black holes, galaxies, solitary star systems, and other massive celestial bodies have independent orbits around the cosmic center, inevitably intersecting. When two massive bodies approach, they either collide and merge or form binary systems. Only when mass differences reach an order of magnitude do they form primary-satellite systems—galaxy clusters. Galaxy clusters are not direct Big Bang products but result from black holes continuously capturing unexpectedly encountered galaxies during operation, a slow and uncertain process still ongoing.

Level 3: Galactic Gravitational System

Galactic gravitational systems are the dominant mode in the universe, directly observable structural models obtained through observation, inevitable results of secondary Big Bang explosions. Since stellar cores both revolve and rotate, standard galactic forms have prominent disk structures. Galaxies consist of stellar cores, galactic disks, and Oort clouds.

The stellar core is the galaxy' s mass and gravitational center, the power source for its level system. It is the residual part from secondary explosions of static celestial bodies, a product of atomic restoration reactions. Its periphery has gas nuclear fusion and active thermal activity, providing the material basis for stellar core rotation. Therefore, all galaxies' stellar cores must rotate, and rotation inevitably forms disk structures.

The galactic disk is the main component, a flat disk composed of stars, dust, and gas. Detectable matter in galaxies has ninety percent within the disk range. The disk shape resembles a thin lens, axially symmetrically distributed around the stellar core. For example, the Milky Way' s disk is about 10,000 light-years thick at center, though this is the slightly bulging nuclear bulge thickness—the disk itself is only 2,000 light-years thick, while the disk diameter is nearly 160,000 light-years, making it extremely thin overall.

The Oort cloud is spatial matter affected by stellar core gravity, operating with the galactic gravitational system. Oort clouds do not belong to nebulae but maintain early Big Bang states.

Level 4: Stellar Gravitational System

Stellar gravitational systems are one level below galaxies, tightly operating systems composed of stars, ecliptic planetary belts, and Kuiper belts. The star is the system' s mass and gravitational center, the power source for its level. It is the residual part from tertiary explosions of static celestial bodies, a product of atomic restoration. Its main body consists of hydrogen and helium gas, with intense thermonuclear fusion causing large-scale light and heat particle emission outward, making stars the universe' s luminous celestial bodies.

Stars both revolve and rotate, thus having a star disk around them, but this disk is not luminous—the main criterion distinguishing stellar from galactic gravitational systems. Planets are celestial bodies formed after tertiary Big Bang explosions, non-luminous and orbiting stars, with orbital directions often matching the star' s rotation direction, all concentrated on the star' s ecliptic plane.

The ecliptic plane is the strong gravitational region of stellar gravity. Matter within the three-dimensional space from the star to the ecliptic plane' s end is absorbed and merged by planets concentrated on the ecliptic plane, making this space deeply vacuum. The ecliptic planetary belt is an important stellar system component and the region where life can exist in the universe.

The Kuiper belt is the weak gravitational region of stellar gravity, a hollow disk-shaped region with dense celestial bodies outside the stellar ecliptic belt. Kuiper belt objects' orbits gradually deviate from the stellar ecliptic plane' s influence from inner to outer regions. Spatial matter in the Kuiper belt is attracted by stellar gravity and absorbed by internal operating asteroids, making its vacuum degree much higher than Oort clouds.

3.1 Principles of the Big Bang

(1) This Chapter' s Cosmic View Basis Point

This chapter studies the Big Bang' s causes and cosmic order establishment process, with the cosmic view basis point set at the cosmic center. Related galaxy and star concepts are relatively rough, with some content potentially conflicting with existing human theories.

(2) Causes of the Big Bang

The cosmic center is a massive celestial body occupying over 99% of total cosmic mass. Due to gravity, its interior bears enormous pressure and high temperature, causing matter to undergo sufficient physical and chemical deformation and become extremely compressed. We define this state as the critical state for atomic deformation. Since we consider existing Big Bang theory valid, total cosmic mass must far exceed the quantity needed for cosmic center atomic deformation. The cosmic center' s current mass has not yet broken this critical state. As long as celestial bodies orbiting the cosmic center are continuously absorbed, another Big Bang could occur anytime.

All hot celestial bodies and spatial matter in cosmic space orbit the cosmic center under its gravity. Although balance can be achieved for certain periods, cosmic lifespan is measured in billions of years. During this lifespan, all celestial bodies orbiting the cosmic center will eventually be absorbed and merged by its powerful gravity—we call this the centripetal trend of cosmic celestial motion.

The cosmic center captures orbiting celestial bodies mainly through gravitational deceleration capture and collision capture. Gravitational deceleration capture means that due to gravity, orbiting celestial bodies gradually slow down, centrifugal force decreases, orbital altitude gradually lowers, and they are finally captured and absorbed. We have profound understanding of this capture method from artificial satellites, but it requires long timescales. Collision capture refers to massive celestial bodies orbiting the cosmic center whose orbits are not regularly arranged, causing collisions that change direction or reduce speed for most fragments, finally being captured and absorbed. This capture method is accidental but can cause super galaxies or galaxy clusters to be absorbed, breaking the cosmic center' s atomic deformation critical state and directly triggering the universe.

The Big Bang' s cause is that the cosmic center bears extreme pressure and high temperature, causing internal matter to undergo sufficient physical and chemical deformation and become extremely compressed. When the cosmic center' s pressure continues increasing, its core matter triggers atomic deformation, with volume shrinking exponentially while releasing geometrically increasing thermal energy. Atomic deformation conditions are extremely harsh, but once triggered, rapid temperature increase causes internal thermal stress to soar, triggering further atomic deformation. Its intensity exceeds known chain reactions. Therefore, once triggered, atomic deformation continues until causing cosmic center explosion. The Big Bang' s cause is atomic deformation occurring inside the cosmic center!

(3) Characteristics of the Big Bang

The Big Bang is a super celestial explosion with unimaginable energy. Triggering conditions are extremely harsh, achievable only by the cosmic center. Its main features include:

Uniqueness: Only the cosmic center' s total mass exceeding critical values can trigger atomic deformation. Explosion energy comes from thermal energy accumulation inside static-state matter after atomic deformation. No other celestial bodies in the universe possess these conditions. Only the cosmic center can trigger this explosion, and only static-state matter explosions qualify as Big Bangs.

Repeatability: Total cosmic mass fully meets Big Bang conditions. Although cosmic order was rebuilt after the Big Bang, maintaining current order, celestial bodies will gradually be absorbed by the cosmic center over time. Once this process breaks the cosmic center's critical state, it will trigger another Big Bang. Therefore, Big Bangs can recur.

Instantaneity: From cosmic center atomic deformation triggering to Big Bang occurrence, from cosmic center disintegration to basic cosmic order establishment, the time elapsed is very short. Existing Big Bang theory claims this is a 3-minute matter. The real situation? Perhaps 3 minutes is too short. Although we cannot accurately determine the time, one point must be emphasized: from Big Bang to new cosmic order establishment is a continuous process. Whether three minutes, three hours, three days, or three years, compared to cosmic lifespan, it is an instant. Since the Big Bang' s cause is atomic deformation inside the cosmic center, all converted static-state matter will be fully restored in the explosion, completed in one go. Therefore, the Big Bang has instantaneous characteristics.

Hierarchical Explosion Characteristics: The cosmic center' s volume is too large—even its collapsed volume exceeds imagination, and its expansion process during explosion is even more unpredictable. One-time explosion theory cannot perfectly explain the entire cosmic reconstruction process, while hierarchical explosion theory can perfectly explain both the Big Bang and post-explosion order establishment. Primary explosions disperse shattered cosmic center fragments throughout cosmic space; secondary explosions establish the material foundation for galaxy formation; tertiary explosions directly create stellar systems; quaternary explosions fill the universe with hydrogen elements. Therefore, the Big Bang is a hierarchical explosion process.

(4) Atomic Restoration and Matter Reconstruction Process

After atomic deformation, cosmic center internal matter converts to static-state matter. After the Big Bang, gravity disappears from this static-state matter, which undergoes atomic restoration reactions under internal stress. The main conditions for atomic restoration are: external force disappearance or reduction —atomic deformation' s main condition is pressure exceeding limits, so when external force disappears or falls below critical values, static-state matter can restore; and absorption of large amounts of heat—atomic deformation releases large heat because electrons' kinetic energy converts, so restoring electrons' original motion states requires absorbing large heat to restore electron kinetic energy.

Matter reconstruction refers to static-state matter undergoing atomic restoration reactions to return to atomic inherent states. Theoretically, reconstruction can regenerate any elements humans have or have not mastered, but various factors affect the proportions of reconstructed elements. Main influencing factors include reconstruction location, method, and thermal reserves, but the most critical is whether sufficient thermal energy can be supplied timely. Matter reconstruction divides into explosion and heat absorption stages—explosion mainly releases pressure, while heat absorption is the atomic restoration process.

Based on reasoning about existing cosmic order, matter reconstruction occurs during early explosion stages. With sufficient thermal energy supply, high atomic number matter reconstruction rates are higher. If reconstruction occurs at cosmic edges or later explosion stages, insufficient thermal energy yields higher rates of low atomic number matter. According to our Big Bang theory, hydrogen elements constitute the largest proportion in post-Big Bang atomic restoration and matter reconstruction processes. Since hydrogen is light, only supermassive celestial bodies can absorb and merge it, leaving large amounts of hydrogen free in cosmic space as nebulae' s main component. Cosmic hydrogen elements can only be produced during the Big Bang process.

3.2 The Big Bang and Establishment of Cosmic Order

(1) Big Bang Process

Atomic Deformation Triggering Process: The cosmic center is a massive celestial body occupying over 99% of total cosmic mass. Due to gravity, its interior bears enormous pressure and high temperature, causing matter to undergo sufficient physical and chemical deformation and become extremely compressed. We define this as the critical state for atomic deformation. When massive celestial body systems orbiting the cosmic center collide or are absorbed for other reasons, or when this absorption and merging process continues to a certain extent, the cosmic center' s atomic deformation critical state is broken, triggering atomic deformation from the deepest pressured areas. This is the Big Bang' s starting point.

Chain Reaction Process: Atomic deformation' s direct consequences are massive thermal energy release and geometric-level space reduction. Once atomic deformation triggers inside the cosmic center, internal space collapse causes outer materials to move centripetally. This position movement under extremely high pressure has enormous impact force, greatly increasing internal pressure and triggering atomic deformation in other materials, repeating to form atomic deformation chain reactions. Once triggered, atomic deformation causes surrounding material temperature and pressure to increase by orders of magnitude, triggering further reactions until the Big Bang occurs.

Space Collapse and Structural Fracture Process: Atomic deformation causes geometric-level volume reduction—space collapse. Cosmic center atomic deformation starts internally, so space collapse also starts internally. After internal space collapse, cosmic center peripheral matter moves centripetally. Since external volume far exceeds internal volume, this centripetal movement causes peripheral structural fracture—structural fracture. Structural fracture is crucial: it can advance the Big Bang timing and enable larger volume celestial separation, providing the prerequisite for forming massive black holes and galaxies after the Big Bang and the foundation for hierarchical explosions.

Primary Cosmic Center Explosion Process: The key factor for cosmic center atomic deformation is bearing gravity exceeding limit values. After internal atomic deformation triggers, accumulated super thermal energy causes cosmic center internal temperature to soar, with internal thermal stress rising rapidly beyond gravity constraints, triggering the Big Bang.

The Big Bang is a continuous process. Once triggered, it continues until all static-state matter inside the cosmic center is restored and cosmic order is preliminarily established. The process experiences initiation, cosmic center gravity disappearance (volume expansion), shattered fragments shooting outward omnidirectionally, cosmic center gravity reconstruction, and cosmic center accretion disk effect. Since the Big Bang starts deep inside the cosmic center, static-state celestial fragments disintegrate and shoot far away. These numerous, massive static-state celestial bodies provide the material basis for secondary or tertiary explosions and are necessary conditions for galaxies and stars.

During the Big Bang' s instantaneous disintegration and cosmic center expansion, cosmic center gravity temporarily disappears—crucial for Big Bang research. This gravity disappearance phenomenon enables widespread celestial dispersion and gives massive celestial bodies initial velocities far exceeding light speed (300,000 km/s), necessary to form current cosmic operation.

After cosmic center peripheral molten matter disintegrates, most molten celestial bodies are reabsorbed and merged by the cosmic center. Only 极少数 massive molten celestial bodies become today' s black holes due to accidental rotational factors. After the cosmic center's Big Bang, remaining parts still possess massive mass and super thermal energy. After undergoing atomic restoration reactions, these parts begin gravity reconstruction, exerting gravity on fragments flying away, gradually decelerating them and causing return motion. Through merging and absorption, they regain absolutely massive celestial bodies in cosmic space, completing cosmic center reconstruction.

Analysis of Celestial Bodies Flying Away from Cosmic Center: Celestial velocity is proportional to applied force and inversely proportional to resistance. For celestial bodies flying away during the Big Bang, initial power is infinitely large while resistance (or gravity) is infinitely small, enabling super velocities.

Light speed refers to light or electromagnetic wave propagation speed in vacuum or media. Modern physics holds that object mass increases with velocity, approaching infinity near light speed, making light speed impossible for massive objects. Only photons with zero rest mass always move at light speed. However, modern physics cognition is based on existing cosmic order. During the Big Bang' s initial stage, the cosmic center experienced collapse then expansion, with gravity disappearing temporarily. This instant' s motion characteristics require redefinition.

Special note: The Big Bang' s initial process characteristics of gravity disappearance and reconstruction, and celestial bodies flying away from the cosmic center at superluminal speeds, apply similarly to secondary and tertiary explosions. The more massive the static-state celestial body, the more significant these characteristics. The so-called light speed limit is based on human cognition from existing times and regions, not objective cosmic truth.

(2) Post-Big Bang Order Reconstruction Process

Fragment Diffusion and Absorption Process: Fragment diffusion and absorption is the Big Bang' s main process. The Big Bang disintegrates the cosmic center, ejecting fragments into cosmic space corners—this is fragment diffusion. After the Big Bang, the cosmic center loses considerable matter, but remaining parts still occupy most mass. Once cosmic center expansion ends and gravity reconstructs, its gravity on diffused fragments takes effect. Fragments flying away gradually decelerate and are absorbed and merged by the cosmic center—fragment absorption, also called cosmic center accretion disk effect.

Fragment diffusion' s main feature is gravity disappearance caused by cosmic center expansion, unique to the Big Bang. Other galaxy collisions causing explosions lack this characteristic—core element for today' s cosmic order formation. Cosmic center absorption is an accretion disk effect—the process of universal gravitation functioning. Whether in Big Bang, galaxy formation' s secondary explosions, or star formation' s tertiary explosions, accretion disk effects exist. After accretion disk effect, 绝大多数 fragments' escape velocities reduce to zero, producing vertically accelerated centripetal motion, absorbed and merged by the cosmic center, making cosmic center total mass regain absolute cosmic mass values. Only when cosmic center mass occupies absolute cosmic mass can stable cosmic operation order be established.

Secondary Explosions and Celestial Rotation Process: After cosmic center accretion disk effect, fragments under cosmic center gravity would move vertically toward it. If this continued, cosmic space would have no galaxies, stars, or other celestial bodies orbiting the cosmic center. What changes vertical motion direction to make celestial bodies cosmic center "satellites"? Our research shows secondary explosions change vertical motion direction, with acceleration exceeding certain limits to become "satellites"—the "celestial rotation process."

We "assume" the cosmic center does not rotate. Under its enormous gravity, celestial bodies attracted back move vertically toward it, difficult to change direction. Only massive celestial explosions have enough energy to change motion direction. Even so, only a small portion of direction-changed celestial bodies become "cosmic center satellites"—绝大多数 are absorbed and merged. Secondary explosions create galaxy gravitational systems while producing celestial rotation.

Tertiary Explosions and Galaxy Establishment Process: If secondary explosions create material conditions for galaxy formation, tertiary explosions are crucial factors because they produce celestial rotation, making numerous celestial bodies stellar core satellites, thus establishing galactic gravitational systems. Tertiary explosions also birth numerous stars, filling the universe with light.

Black Hole and Galaxy Cluster Formation Process: Black holes are born simultaneously with the Big Bang, formed when cosmic center outer molten matter is separated during the Big Bang, encounters collisions changing direction, and becomes cosmic center satellites. Black hole volume and mass far exceed stellar cores. Although bearing extreme temperature, pressure, and intense thermal activity, strong gravity prevents any internal matter release. Because black hole mass and volume far exceed stellar cores or even entire galaxies, they can capture galaxies and form galaxy clusters. The difference between black holes and galaxies: galaxies' material basis is static-state matter flying from the cosmic center, enabling secondary and tertiary explosions to form galaxies; black holes' material basis is molten matter flying from the cosmic center, without further explosion possibilities, preserving original shape and volume.

The rotation process is difficult. Countless molten matter bodies flew from the cosmic center during the Big Bang, but 绝大多数 were reabsorbed and merged, consistent with universal gravitation. The probability of massive celestial bodies becoming cosmic center satellites is extremely low; for black holes, non-exploding molten bodies, the probability is even lower. Black holes can become cosmic center satellites only if they collide with other massive celestial bodies during absorption, changing direction. This difficult rotation process creates black holes, making black hole formation relatively low-probability.

Galaxy cluster formation occurs after cosmic order preliminary establishment, resulting from black holes' gravitational effects on encountered galaxies during operation—a slow process.

Primary vs. Existing Cosmic Order: The Big Bang completes instantly, establishing the Level 1 cosmic gravitational system. However, this so-called cosmic order is only primary: a hierarchical rotating world with cosmic center as Level 1, stellar cores as Level 3, and stars as Level 4, where stellar systems orbit stellar cores forming galaxies, and galaxies orbit the cosmic center forming the whole world.

After Big Bang establishment of Level 1 cosmic gravitational systems, black holes, galaxies, and stars orbiting the cosmic center absorb and merge other celestial bodies within their influence ranges, cleaning their orbital planes through collisions to form today' s "existing cosmic order." Transition from primary to existing cosmic order may require billions of years.

(3) Consequences of Failed Cosmic Order Reconstruction

Not every Big Bang necessarily establishes new cosmic order. Theoretically, Big Bangs may not always establish new order because celestial rotation relies on collisions or secondary explosion power to change motion direction, which involves great randomness. If insufficient celestial bodies successfully orbit the cosmic center after a Big Bang, more flying fragments will be reabsorbed, potentially breaking the cosmic center' s atomic deformation critical state again and triggering new Big Bangs. If post-Big Bang order reconstruction fails, new Big Bangs will be triggered until new cosmic operation order functions normally. Therefore, today' s cosmic order may have required several consecutive Big Bangs to establish.

3.3 Secondary Explosions and Galaxy Formation

(1) Secondary Explosions

Secondary explosions are continuations of the Big Bang process, continuous explosions of massive static-state celestial bodies disintegrated from the Big Bang, unable to occur independently. Unlike the Big Bang principle, secondary explosions' initial cause is static-state matter undergoing atomic restoration reactions, causing internal volume expansion and sharply increasing internal stress, producing secondary or tertiary explosions.

The cause is massive static-state celestial bodies separated from the cosmic center, losing strong external pressure constraints, disintegrating and exploding under powerful internal thermal stress, causing numerous static-state fragments to diffuse outward. Some fragments from secondary explosions finally form stellar systems. Like the Big Bang, secondary explosions start internally. After external force shrinks geometrically, internal static-state matter with super thermal reserves prioritizes "atomic restoration," with internal volume expansion being the main power for secondary (or tertiary) explosions.

During secondary explosions, disintegrated fragments not yet undergoing atomic restoration diffuse around stellar cores, providing material basis for tertiary explosions and star formation. Secondary explosions resemble Big Bang processes, with similar gravity disappearance, fragment diffusion, and accretion disk effects, forming extensive galaxies, though scale and effects cannot compare. Post-secondary explosion stellar core mass also occupies over 99% of galaxy mass.

(2) Stellar Core Ignition and Celestial Rotation

Secondary and tertiary explosions are also static-state matter "atomic restoration" processes, releasing large amounts of hydrogen, helium, and other elements. These elements are absorbed and merged by stellar cores under gravity. When stellar cores accumulate sufficient hydrogen, hydrogen nuclear fusion triggers, and stellar cores ignite (similar to but larger-scale than star ignition). Stellar core ignition instantly produces enormous impact force, changing motion direction of other celestial bodies flying toward the core, causing celestial rotation.

After ignition, stable thermonuclear fusion forms, continuously swallowing celestial bodies not rotating to become its "satellites." Such stellar cores, although having more powerful thermonuclear reactions than stars, cannot release large amounts of light and heat particles like stars due to powerful mass and gravity. Although humans cannot directly confirm their existence through observation, other methods can confirm them.

If black hole formation' s celestial rotation is accidental, galaxy formation' s rotation is inevitable, with stellar core ignition and star formation being crucial factors. Stellar core ignition changes motion direction of all matter flying toward the core, including massive hot celestial bodies and massive stellar systems, as well as tiny spatial matter—making stellar core ignition the most critical factor for galaxy formation. Tertiary explosions also facilitate celestial rotation by sending fragments in all directions, changing centripetal motion direction. Although direction-changed celestial bodies need gravitational acceleration to become gravitational center satellites, and only a small portion finally become satellites, celestial rotation is the necessary condition for becoming a satellite. Without direction change, celestial bodies would be absorbed and merged by the gravitational center. Therefore, explaining celestial rotation' s rationality is key to whether Big Bang and cosmic order establishment theories hold.

Celestial Rotation Shapes Galaxy Characteristics: In secondary explosions, stellar core ignition and tertiary explosions cause distant celestial bodies to rotate and become stellar core satellites—this is the "galaxy"formation process. Celestial bodies rotating around stellar cores include massive hot celestial bodies, large-scale stellar systems, and tiny spatial matter—complete early cosmic formation forms. Once gravitational systems rotating around stellar cores form, galaxy formation' s primary stage is complete. After galaxy establishment, hot celestial bodies and stellar systems orbiting stellar cores have individual orbits, frequently colliding and merging. Large hot celestial bodies continuously absorb and merge spatial matter on their orbits. After long-term absorption and merging, large hot celestial bodies and stellar systems form fixed, stable orbits. When internal collision events become occasional, galactic operation order is established, marked by the appearance of galactic disk morphology.

(3) Stellar Core Revolution and Rotation

Stellar core revolution is also galactic revolution, mainly because stellar cores (galaxies) operate under higher-level gravitational system control, orbiting their gravitational centers, which can be cosmic centers or black holes. This revolution is passive, with stellar cores being tiny components of higher-level systems.

Stellar core rotation occurs because stellar cores are galactic mass and gravitational centers, power sources for their level systems. All hot celestial bodies, stellar systems, and Oort clouds controlled by stellar cores orbit them. Stellar cores are residual parts from secondary explosions of static celestial bodies, products of atomic restoration reactions, with peripheral gas nuclear fusion and active thermal activity, providing power and material basis for rotation. Therefore, all galactic stellar cores must rotate, and rotation inevitably forms disk structures.

(4) Galaxy Identification Criteria

Human cosmic observation has lasted thousands of years, with modern astronomy spanning centuries. Naming methods for countless star clusters, galaxies, and galaxy clusters have inevitably deviated historically. From this paper' s perspective, galaxy identification and judgment criteria are whether they have complete disk structures.

3.4 Tertiary Explosions and Stellar Systems

(1) Tertiary Explosions

Tertiary explosions are continuations of the Big Bang process, continuous explosions of massive static-state celestial bodies disintegrated from secondary explosions, unable to occur independently. Unlike the Big Bang principle, tertiary explosions' initial cause is static-state matter undergoing atomic restoration reactions, causing internal volume expansion and sharply increasing internal stress.

The cause is massive static-state celestial bodies separated from stellar cores, losing strong external pressure constraints, disintegrating and exploding under powerful internal thermal stress, causing numerous static-state fragments to diffuse outward, producing stellar systems. Tertiary explosion fragments not undergoing atomic restoration diffuse massively outward, providing material basis for planetary system formation. Tertiary explosions resemble Big Bang and secondary explosion processes, with similar gravity disappearance, fragment diffusion, and accretion disk effects, forming stellar systems, though scale and effects cannot compare. Post-tertiary explosion star mass also occupies over 99% of stellar system mass.

(2) Star Ignition and Celestial Rotation

Like secondary explosions, tertiary explosions are static-state matter "atomic restoration" processes, releasing large amounts of hydrogen, helium, nitrogen, oxygen, and other elements. These elements are absorbed and merged by stars under gravity. When stars accumulate sufficient hydrogen, hydrogen nuclear fusion triggers, and stars ignite. Star ignition causes instantaneous volume expansion and enormous impact force, changing motion direction of other celestial bodies flying toward the star, causing celestial rotation.

After ignition, stable thermonuclear fusion forms, with intense internal thermal activity continuously releasing light and heat particles outward—stars' main distinguishing feature from other celestial bodies. Star ignition changes motion direction of all matter flying toward stars, including massive hot celestial bodies and tiny spatial matter, making star ignition the most critical factor for stellar system formation. Although direction-changed celestial bodies need gravitational acceleration to become gravitational center satellites, and only a small portion finally become satellites, celestial rotation is the necessary condition for becoming a satellite. Without direction change, celestial bodies would be absorbed and merged by the gravitational center. Celestial rotation is the key factor for stellar system formation.

(3) Star Revolution and Rotation

Star revolution is also stellar system revolution, mainly because stars (stellar systems) operate under higher-level gravitational system control, orbiting their gravitational centers, which can be galaxies or cosmic centers. This revolution is passive, with stars being tiny components of higher-level systems.

Star rotation occurs because stars are stellar system mass and gravitational centers, power sources for their level systems. All hot celestial bodies and asteroid belts controlled by stars orbit them. Stars are residual parts from tertiary explosions of static celestial bodies, products of atomic restoration, with peripheral gas nuclear fusion and active thermal activity, providing power and material basis for rotation. Therefore, all stars must rotate, and rotation inevitably forms stellar ecliptic plane structures.

(4) Stellar System Order Establishment

The ecliptic plane is the star' s equatorial plane, a customary term in Chinese astronomy avoiding confusion with planetary equatorial planes. This definition of stellar equatorial planes as ecliptic planes represents ancient Chinese wisdom worth promoting.

All stars have high-speed rotation characteristics, giving ecliptic planes higher linear velocities and gravity—why humans launching satellites try to borrow Earth' s equatorial advantages. Similarly, celestial bodies operating on stellar ecliptic planes have greater inertia and kinetic energy. During early stellar system establishment, orbiting celestial bodies were chaotic, with high collision probabilities. Due to higher kinetic energy and inertia, ecliptic plane bodies mostly absorb and merge bodies from other orbits. Even if occasional other-orbit bodies absorb ecliptic plane bodies, they face future collisions with larger ecliptic plane bodies, eventually being absorbed and merged. The final result is stellar gravitational systems concentrating on stellar ecliptic planes—this is how stellar ecliptic planes form and how stellar system operation order establishes.

The stellar ecliptic plane is a strong gravitational region. Matter within three-dimensional space from the star to ecliptic plane ends is absorbed and merged by ecliptic plane planets, making this space deeply vacuum. The Kuiper belt is a weak gravitational region, a hollow disk-shaped region with dense celestial bodies outside the stellar ecliptic belt, with orbits gradually deviating from stellar ecliptic plane influence. Kuiper belt spatial matter is attracted by stellar gravity and absorbed by internal asteroids, making its vacuum degree much higher than Oort clouds.

(5) Star Identification Criteria

The criterion for identifying stars is whether they emit light and heat outward. The sun is the most typical star; the solar system is the most typical stellar system.

4.1 The Bankruptcy of Cosmic Expansion Theory

Cosmic expansion theory began in 1929 when American astronomer Hubble, based on the observation that "all nebulae are moving away from each other, and the farther away, the faster," concluded that the entire universe is continuously expanding, with galaxy separation being part of expansion rather than repulsion. Although cosmic expansion theory led to Big Bang theory, our Big Bang theory firmly denies cosmic expansion theory' s rationality. We believe the universe is a gravitational system, with size determined by cosmic center gravity. If cosmic center gravity remains unchanged, cosmic size will not change.

Astronomical observations of galaxies moving apart result from different gravitational system orbits. Different gravitational systems have different motion directions and speeds, creating visual separation; observed from different locations, they might appear to approach. Therefore, cosmic expansion is theoretically impossible!

4.2 Beyond the Light Speed Limit

In existing physics, light speed is a limit—light' s vacuum propagation speed (300,000 km/s) is an insurmountable threshold. Although light speed is too fast for humans, for cosmic worlds and astronomy, 300,000 km/s is too low to explain cosmic formation. Thus, quantum mechanics and spacetime curvature theories emerge to justify belief that the Big Bang created today' s cosmic order.

We believe this light speed limit is correct within the solar system, but its applicability beyond the solar system is uncertain because each stellar system' s gravitational environment and internal thermal activity intensity differ, making light and heat particle speeds different, let alone in larger systems like galaxies. During the Big Bang, the cosmic center' s explosion process involves collapse then expansion. During expansion, cosmic center gravity disappears. Under gravity-disappeared states, celestial motion speeds can increase infinitely, which can be understood as "spacetime curvature." This theory easily explains the Big Bang and cosmic formation, better restoring cosmic simplicity. Therefore, we believe celestial motion speed limits are relative.

4.3 Redefinition of Black Holes

(1) General Relativity' s Description of Black Holes

Black holes are a general relativity concept, celestial bodies existing in cosmic space. Black hole gravity is so powerful that escape velocity within the event horizon exceeds light speed. Modern astronomy defines black hole formation: when a star prepares to die, its core rapidly contracts and collapses under self-gravity, causing powerful explosions. When all core matter becomes neutrons, contraction stops, compressing into a dense celestial body, also compressing internal space and time. In black holes, core mass is so large that contraction continues endlessly, with even neutron repulsion unable to resist. Neutrons themselves are crushed into powder under compressive gravity, leaving behind unimaginably dense matter. This massive gravity causes any nearby object to be sucked in.

(2) Criticism of Existing Black Hole Formation Process

Modern astronomy defines black hole formation as stellar death collapse results, completely wrong and clearly violating mass conservation principles. The key factor determining celestial gravity is total mass, not density. Regardless of a star' s life or death, its core gravity cannot change geometrically, let alone cause atomic structure collapse. Black holes' powerful gravity results from ultra-high mass, not ultra-high density. The main method for finding black holes is not light and particle observation but gravitational calculation. For example, our galaxy cluster' s core must have a gravitational core—this is a real black hole.

(3) Redefinition of Black Holes

Black holes are celestial bodies formed from massive molten matter separated during the Big Bang, the largest 单体 (or combination) orbiting the cosmic center. Their mass and gravity are one level lower than the cosmic center but still strong enough to prevent any particle release, emitting neither light nor radiation. Internal temperature and pressure are insufficient to trigger atomic deformation but sufficient for chemical deformation, making Big Bangs impossible. Humans cannot observe or measure black holes but can calculate their positions. We predict a real black hole exists at our galaxy cluster' s center.

References

[1] (美) 希尔克著，邹振隆译：宇宙的起源与演化-大爆炸 [M]，科学普及出版社，1988.
[2] 戴文赛编著：天体的演化 [M]，科学出版社，1977.
[3] 欧阳自远著：天体化学 [M]，科学出版社，1988.
[4] 孙显元著：现代宇宙学的哲学问题 [M]，人民出版社，1984.
[5] 中国科学技术大学天体物理组编：西方宇宙理论评述 [M]，科学出版社，1978.

Note: Figure translations are in progress. See original paper for figures.