Chapter 7　The Nature of Light and Spatial Alignment in the Universe

Section 1: Redefining Light and a Structural Reinterpretation of the "Speed of Light (c)"

In conventional physics, the speed of light, denoted as “c,” has been defined as the highest possible velocity at which a material particle—namely, the photon—can travel through a vacuum. This notion underpins Einstein’s theory of special relativity and serves as a fundamental speed limit governing all phenomena in the universe.

However, in this chapter, we redefine “c” not as a physical limit of movement, but as a constant of spatial order representing the maximum efficiency at which wave-based alignment can be established. In other words, light is not a phenomenon of an entity traveling through space, but rather the emergence of information in a direction where spatial structure and wave alignment are achieved.

From this perspective, photons do not pierce through space as particles, but instead appear as resonant waves manifesting on top of a spatial structure that is aligned with the observer. Thus, the value “c” is not merely a velocity, but can be interpreted as the amplitude of spatial waves that achieve alignment at the fastest possible rate.

Accordingly, the following conceptual redefinition becomes possible:

Conventional Concept	Redefinition Based on the Theory of Alignment
Speed of light (c) = Maximum velocity in the universe	Maximum efficiency of wave alignment (a constant)
Photon = Particle	A form of spatial wave that appears under an aligned condition
Propagation = Movement over distance/time	Emergence or resonance phenomenon through structural alignment

By redefining light not as something that "travels" but rather as something that "emerges through alignment," we can achieve consistency with the immediate visibility of distant galaxies and with the coherent structure of the early universe. This redefinition also aligns perfectly with the post-Big Bang model of the expanding, orderly universe. In this framework, the speed of light "c" is synchronized with the absolute expansion rate of the

universe and represents the minimal unit necessary for observability under aligned conditions.
Furthermore, a critical supplementary premise is adopted regarding visual perception: there is no delay in the arrival of light imagery. According to this theory, perception is an immediate resonant phenomenon caused by alignment, meaning the observed image appears in the present moment relative to the observer. Thus, the visual information of light arises instantly through the establishment of spatial alignment, and notions of travel time or delay are not considered. This explains why we can observe galaxies located 13.8 billion light-years away as they appear now.

As an additional note, the following is a hypothetical evaluation concerning this mode of perception:

Hypothesis on Redshift Based on a Comparison Between Cosmic Particle Density and Earth's Atmosphere

This supplement evaluates the potential for light to undergo scattering and absorption over long distances, based on the total number of sparse particles present in cosmic space, by comparing it with the density of Earth's atmosphere.
On Earth, Rayleigh scattering is clearly observed within just 10 to 100 kilometers of the atmosphere due to its high molecular density. In contrast, despite the vast distance of approximately 13.8 billion light-years in space, standard cosmology assumes that “light propagates in a straight line without scattering.” However, this assumption is both physically and theoretically inconsistent, as interstellar gas, particles, and structural tensors are indeed present in cosmic space.
In the Big Bang cosmology model, the redshift of light is interpreted as a “stretching of wavelength due to the expansion of space,” based on the premise that light travels in a straight path across the universe. Yet, assuming that gas and dust have no influence over a span of 13.8 billion light-years is physically unnatural. It is more accurate to say that the omission of these realistic effects is merely a theoretical convenience.

[Assumptions]

• Atmospheric molecular density at sea level on Earth: 2.5×10^{25} molecules/m^3
• Assumed average particle density in cosmic space: 1 particle/m^3
• Distance traveled by light: 13.8 billion light-years (13.8×10^9 light-years ≒ 1.3068×10^{26} m)

[Calculation]
Assuming that light travels a distance of 13.8 billion light-years through space, the number of particles encountered is:
1 particle/m^3 × 1.3068 × 10^{26} m ≒ 1.3068 × 10^{26} particles.
Dividing this by the molecular density of Earth's atmosphere gives the atmospheric equivalent depth:
(1.3068 × 10^{26}) / (2.5 × 10^{25}) ≒ 5.22 meters.

[Conclusion]
When light travels a distance of 13.8 billion light-years through cosmic space, the total number of particles encountered is equivalent to the density found in approximately 5.22 meters of Earth's atmosphere.
This implies that cosmic space is not a perfect vacuum but functions as a highly rarefied atmospheric layer, potentially influencing the redshift of light.
This interpretation serves as foundational support for a new hypothesis: redshift arising not from cosmic expansion but from particle-induced scattering within interstellar space.
Accordingly, the present section establishes the redefinition of light and the true nature of the alignment speed **c** as the theoretical basis for subsequent discussions on redshift, deep-space visibility, and the transformation of wave structures into matter.

What is particularly important is that the *spatial extent of light reception* differs significantly between observations of nearby celestial bodies, such as Mars, and those of distant galaxies 13.8 billion light-years away—even when using the same telescope.
For nearby objects, light travels through a relatively wide area and is received as a broadened wavefront.
In contrast, light from distant galaxies reaches us along an extremely narrow, linear path.
Because of this distinction, even if the average particle density of the universe is extremely low (equivalent to only about 5.22 meters of Earth's atmosphere), the accumulated scattering and interference from particles encountered along this single, confined light path can induce non-negligible modulation—specifically, redshift—in the wavelength of light.
Thus, this observation provides empirical and structural support for the hypothesis presented in this section:
that "light reaches us through alignment," and that
"redshift arises from wave reconstruction rather than spatial expansion."
This insight reinforces the theoretical framework from the standpoint of observed cosmic structure and spatial coherence.

Supplement: The Fallacy of Measuring Near and Distant Observations with the Same Standard, and Differences in Perception Due to Alignment Structures

Light arriving from distant sources may appear to travel in a straight line, but in reality, it is affected by a complex combination of particle density, gravitational wells, and wave structures present in space.

In the case of extremely distant objects—such as those 13.8 billion light-years away—the information reaching the receiving surface travels through a narrow, filament-like alignment path within the spatial structure.

This is a mechanism entirely different from that of nearby observations.

Nevertheless, conventional theories overlook this structural aspect of distance and instead evaluate light based purely on linear distance and time.

This oversight, we propose, is the primary source of misinterpretation—specifically, the mistaken attribution of redshift to cosmic expansion, when in fact it arises from wave interactions and cumulative distortions along structured paths.

Section 2: The Observation of Light Speed and the Role of Structural Alignment in Visual Perception

1. The Definition of Light Speed and the Paradox of Observation

- In conventional physics, light is defined as traveling at approximately 300,000 km per second in a vacuum.
- However, the fact that we can currently observe galaxies located 13.8 billion light-years away is not direct proof that the light "arrived" after traveling this distance, but rather that "the image has been visually perceived."
- This opens the door to an alternative interpretation: that light is not something that traveled across space, but something that becomes simultaneously perceivable through structural alignment.

2. The Mechanism of Visual Perception Through Alignment

- If light is considered not as a particle but as a manifestation of a structurally aligned state, then the light we perceive from distant galaxies did not “pass through” the intervening space, but rather appears simultaneously at the observation point as a result of alignment.
- In this theory, the speed of light is not a "transit velocity," but is redefined as the "environmental structural density condition required for alignment to occur."

3. The Relationship Between Time and Alignment

- The conventional belief that “light arrival = passage of time” should be redefined as “alignment established = observation now occurs here and now.”
- In other words, light speed is not a physical velocity, but a representation of the threshold structural density for appearance via alignment. Once the spatial structure is aligned, observation becomes instantaneously possible.

4. Empirical Perspective: Consistency of the Cosmic Microwave Background and Distant Galaxies

- In practice, phenomena such as the Cosmic Microwave Background (CMB), which is observed uniformly across the sky, are not about “where it came from,” but about “under what structural alignment it becomes visible.”
- Similarly, the fact that galaxies 13.8 billion light-years away can be observed can be explained not by the notion that light traveled for 13.8 billion years, but by assuming that visual perception occurs the moment structural alignment is achieved—thereby resolving the contradiction.

5. Conclusion

- The speed of light is not the velocity of a physical entity traveling through space, but rather an indicator of spatial density and directional alignment necessary for structural coherence to occur.
- From this perspective, the nature of light is neither a wave nor a particle, but is redefined as the very order of space manifested through alignment.

Redefinition in This Theory

In this theory, the observation of light is defined as a phenomenon in which light appears at the point in space where structural coherence (alignment) is established. In other words, light does not “travel” through space—instead, it becomes visible the moment coherence is completed at a given location. This coherence spreads across space at a constant rate (the speed of light, c), in accordance with the absolute order instilled by the origin of the universe (the Big Bang). Therefore, the condition of light observation can be described as follows:

t_0 = the moment coherence is completed ⇒ Observation occurs (with zero delay)

If the observer exists at a location in space where coherence has been completed at time t_0, then light is observed *at that very moment*.

Additionally, the condition for observation is simply defined as:

$S = c \times T_s$

Where:

- S: The spatial location at which observation becomes possible due to structural coherence
- c: The absolute velocity of coherence expansion from the Big Bang (equal to the speed of light)
- T_s: The elapsed time of coherence progression (proportional to distance from the origin)

Thus, light becomes visible at the exact moment the order of coherence reaches a given position; there is no need for a particle or wave to physically arrive at that point.

Section 3: Unified Theory of Light Coherence, Absolute Velocity, and Observation Emergence

1. Cosmic Structure and the Ordered Concept of "Coherence Velocity"

For the universe to have emerged from the Big Bang and for space—including waves and structure—to have expanded, there must exist an absolute velocity of order, referred to here as the coherence velocity. Without such a speed, waveforms, tensor structures, and tensor grids could not be defined within space, and the very formation of the universe would be impossible.

This velocity is not simply the "speed of light" in the conventional sense. Rather, it is **the velocity at which space itself unfolds—**a velocity that defines the propagation of universal order. According to this definition, light is not a particle that travels through space, but an informational wave phenomenon that appears at the moment and location where coherence is completed.

[Revised Fundamental Equations]

- Universal Absolute Velocity (v_univ, Coherence Velocity):

  v_univ = c = 3.0 × 10^5 km/s
- Propagation Distance of Spatial Coherence (Tensor Spread):

  Tensor Spread = v_univ × t
- Condition for Observation Emergence (Coherence Completion Time = t_0):

  At the moment t = t_0, coherence is completed and observation occurs (zero delay).
- Position Where Observation Emerges Due to Coherence Completion:

  S = c × T_s

  • S: Position where coherence reaches and observation is established

• T_s: Time required for coherence to reach that position

These equations indicate that light appears at the exact moment coherence reaches the location, and no propagation or particle motion through space is required.

2. The Hypothesis: Light Observation as a Coherence Phenomenon

In this hypothesis, light is not something that "travels" to the observer, but rather a wave phenomenon that emerges instantly through tensor coherence between the emission point and the observation point. As long as the coherence is maintained, light remains visible continuously.

This perspective resolves several contradictions in standard physical theory:

Contradiction 1: Why Distant Galaxies Are Still Visible Today

- Under the expanding universe model, distant galaxies recede faster than the speed of light, so their light should not reach us anymore.
- However, we still observe galaxies that are 13.8 billion light-years away.
- The coherence hypothesis claims that observation is an instantaneous event caused by spatial coherence, requiring no delay or travel.

Contradiction 2: The Impact of Time Delay on Cosmic Order

- If light or gravity were delayed in transmission, the real-time structure of planetary or galactic systems would collapse.
- Under the coherence model, spatial resonance and observation occur instantaneously along a coherent path, preserving order in the universe.

3. Theoretical Unification Through the Coherence Hypothesis

This coherence hypothesis has the potential to break through many of the limitations of modern physics by redefining the following core concepts:

- It eliminates the very need for the concept of a speed limit called the speed of light.
- It completely resolves the contradiction between cosmic expansion and observable distances.
- It enables gravity, light, and waves to all be described using a **unified concept of coherence**.

4. Conclusion: The Essence and Significance of the Coherence Model

Light does not travel — it emerges at a location through coherence. This definition is the key to understanding the universal order and instantaneous interaction that permeate the

cosmos.

Based on this theory:

- Even galaxies 13.8 billion light-years away can be observed here and now.
- The "speed of light" is not a fundamental wall but merely a boundary of coherence density.
- Gravitational waves, electromagnetic waves, and light can all be instantaneously connected.

In essence, the universe does not propagate — it coheres and appears.

This truth penetrates light, space, gravity, and time under a single principle, offering a decisive unification capable of redefining all physical theories.

Thus, the recognition that “coherence is the essence of cosmic structure” is no longer a hypothesis — it becomes a principle.