Main Text

Introduction

In traditional physics, light is viewed both as a particle and a wave — a carrier of energy and information. However, the concept of light as a stream of energy presents difficulties when explaining various phenomena. This paper proposes a new perspective: **light is purely information**, transmitted through **spatial particles** that pervade the universe.

Theoretical Basis

Space is not a perfect vacuum; it is filled with spatial particles of varying densities. These particles form the medium through which information propagates. Light interacts with spatial particles, allowing it to propagate, refract, reflect, and be perceived across the universe. The density and distribution of these particles directly affect the efficiency and characteristics of information transmission.

Light as Information, Not Energy

If light were truly energy, then whenever light strikes an object and is perceived, a significant amount of energy transfer should occur. For example, when observing a distant illuminated surface, the human eye should theoretically absorb substantial energy — enough to cause damage. Yet in reality, humans can observe illuminated environments for extended periods without such harm, suggesting that **what is being transmitted is information, not energy**.

Similarly, the phenomenon of snow blindness can be explained through information overload. White surfaces reflect all frequencies, leading to a massive influx of information. Prolonged exposure results in the overstimulation and eventual damage of retinal nerve cells due to **information processing overload**, not thermal or energetic damage.

The Problem of Long-Distance Light Transmission

Observations such as those made by the Hubble Space Telescope, which capture light from galaxies billions of light-years away, raise a paradox. If light were energy, it should dissipate over such vast distances and become undetectable. However, light retains its informational content across the universe. This strongly suggests that light is better understood as **information propagated through spatial particles**, not as a form of traveling energy.

Visible and Invisible Light

The distinction between visible and invisible light stems from the interaction between information waves and spatial particles at different frequencies. Light itself remains as information; it is the response capability of spatial particles at certain frequencies that determines human perceptibility.

A New Interpretation of Wave-Particle Duality

Light exhibits both wave-like and particle-like behavior. In this framework, **free information flow manifests as wave-like behavior**. When information becomes **entangled or**

"knotted" into localized structures, it exhibits **particle-like properties**. The particle nature of light is thus a consequence of **information knotting**, not the existence of a physical particle.

Quantum Entanglement and the Limit of Spatial Information Transmission

Quantum entanglement, in this view, is the result of two particles' information becoming knotted together, forming a real-time informational link. This link is maintained through the wave propagation of spatial particles. However, this synchrony has a **distance limitation**.

It is proposed that the information propagation limit of spatial particles is approximately **300,000 kilometers per second** — corresponding to the conventional speed of light. Thus, if entangled particles are separated by more than approximately 300,000 kilometers, their informational link would break down. For example, placing entangled particles 600,000 kilometers apart would likely disrupt their synchrony, not because of intrinsic changes in the particles, but because of the limitations of the spatial medium's information transmission capability.

Conclusion and Outlook

This paper introduces a new hypothesis: **light is information** rather than energy. Reinterpreting light propagation, visual perception, long-distance astronomical observations, and quantum entanglement under this framework yields a coherent theoretical structure. Further experimental verification of spatial particle properties and information propagation limits could open a new avenue for understanding the fundamental architecture of the universe.

This work is an exploratory attempt, intended to inspire new ideas and research directions.