

## Research Article

### Exploring the Nature and Origins of Faster-than-Light Motion

\*LIE Chun Pong

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#### ABSTRACT

More than 100 years ago, Einstein established the speed of light as a universal constant, proposing that nothing in the universe can surpass it. This research paper seeks to reexamine that foundational assumption from a novel perspective, investigating whether the speed of light is truly invariant or if different photons may, under certain conditions, exhibit varying velocities. Our findings suggest that the universe may inherently demonstrate wave-particle duality. During measurement, some light may appear to travel faster as a means of avoiding direct detection.

**Keywords:** Super-fast-photon, Slow photons, Speed of light, Wave-particle duality, Avoiding measurement, Spacetime curvature.

#### INTRODUCTION

Over a century ago, Einstein [1][2] proposed that the speed of light in a vacuum, represented as  $c$ , is constant and acts as a fundamental constant in the theory of special relativity. According to established physical laws, no known object or information exceeds this universal speed limit. This research paper aims to explore, from a new theoretical perspective, whether the constancy of the speed of light is truly universal or if variations exist among different photons, which could suggest photon mass or new quantum effects. We will review current discussions possible dispersion relations in quantum wave like particle effect, and the effects of deformed special relativity on photon travel speeds while measure.

The James Webb Space Telescope confirms that there is something seriously wrong with our understanding of the universe, and reveals that there is an unknown physics.

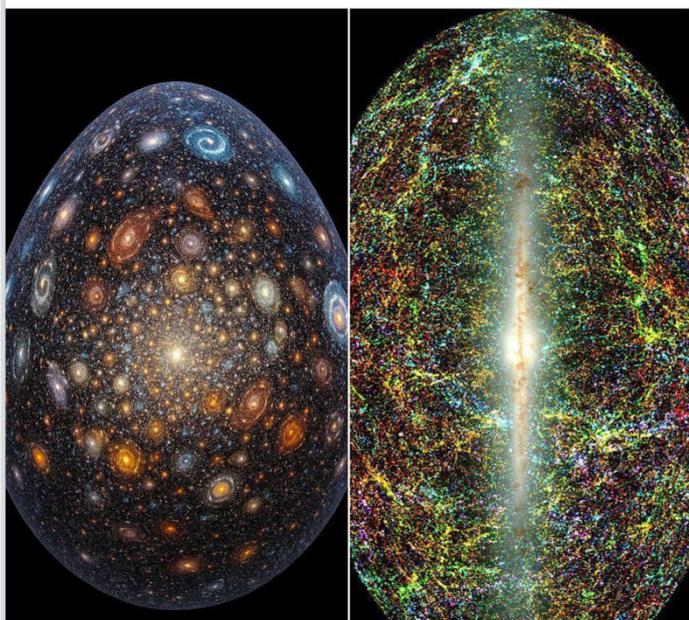


Figure 1: James Webb new image about the universe

According to the James Webb photo in (figure 1), the James Webb, have taken the new universe photo, and it state there is something seriously wrong with our understanding of the universe, and reveals that there is an unknown physics. Based on our new hypothesis, the space of the universes always contains a micro background noise that consistently disturbs images taken by satellites. We wonder whether these conditions occur because some light wave-particles travel faster than the normal speed of light ( $c$ ). To address the universe's background noise, this research proposes the bold hypothesis that the faster speed of light may be caused by measurement events. Specifically, the wave-like particles of light may try to avoid being captured during measurement, causing them to run faster than the normal ( $c$ ). Meanwhile, the particles that are captured are collapsed into particles moving at the normal speed of light ( $c$ ). In other words, there could be a possibility that the wave-like particles run faster because they are avoiding measurement.

Our assumption is that, like you driving a car and traveling, when you see a traffic policeman who wants to take a photo to catch speeding, you will drive at a normal speed, so you won't be caught for speeding. If you are already in front of the traffic policeman's camera, you will definitely try to stay away and avoid being captured. Therefore, you will slow down the speed and not being over speed (normal speed). In-addition, when you see a traffic policeman holding a camera, you will no doubt make every effort to stay out of reach and not be apprehended. Therefore, at the far long distance, you will drive faster than normal to avoid the traffic policeman, from taking you a photo of your car.

Physicists have previously stated that there are tachyons and slow-moving particles; that is, particles that travel faster than the speed of light are called "tachyons," while particles moving slower than the speed of light are called bradyon. A "bradyon" needs a lot of energy to accelerate close to the speed of light, while a "tachyon" needs a lot of energy to slow down to near the speed of light.

This research paper introduces a new idea that reveal the conventional idea of Tachyon: Since the conventional of the idea of Tachyon is born to be faster than light when it is create (it has to be use a lot of power to slow down the Tachyon speed). While this research paper suggested that, light particles can be categorized into three types: those moving faster than the speed of light ("super-fast-photon"), those moving at the speed of light ("photons"), and those moving slower than the speed of light ("slow photons").

Additionally, fundamentally, this research paper's hypothesis suggests that fast photons and slow photons share some similarities with tachyons and bradyon but also have some unique features.

There may be different probabilities of allowing the speed of light to be faster than normal ( $c$ ).

#### There are five possibilities:

- (I) Light interference phenomena
- (II) Constructive interference
- (III) Destructive interference
- (IV) Different phenomena of light beams due to the expansion of spacetime in the universe. Consequently, in a general sense, the speed of light is constant; in a specific sense, the speed of light may be non-constant. The speed of light is also influenced by the curvature of space (e.g. Blackhole).
- (V) Light avoiding being measured, so it runs faster than normal to avoid detection.

This research paper argues that the basic concept of "tachyons" is somewhat different. While the speed of light is constant, it can be accelerated to a speed faster than that of a photon for some reason, thus becoming a fast photon. This differs from the conventional tachyons concept which born to be fast, inherent concept of "tachyons" in tachyon theory. Second, while the consensus is that slow photons are slower than regular photons, slow light is simply an evolution of photons themselves. That is, fast and slow photons evolve from photons, and they are not inherently different. The constant speed of light remains unchanged, but fast photons can evolve under certain conditions (e.g. blackhole), potentially becoming faster or slower than standard photons. It's possible that without observation, a fast photon might be faster than a photon when it is a wave-particle-like condition, but under certain observational conditions, it might appear normal when the wave of light collapse.

#### Practical Applications

Our research paper has found some evidence supporting the phenomena mentioned above. Here are some photographs captured by the James Webb Satellite, which may prove that our (v) postulation is correct (figure 2) (figure 3).



Figure 2: The shadow with backlight of the Galaxy

In practical observations of the galaxy or universe, scientists often face interference from background light and other noise, which makes clear observation difficult. I believe this background light noise is caused by three types of light traveling at different speeds. The first type is "slow light particles," which are slower than photons. Because their speed is slower than photons, a patch or area of "bright light," or what we call "intense light," appears in front of them, blurring the image. The second type is "fast light particles," which travel faster than photons. Because they are faster than photons, they cause objects to appear unclear under strong background light, creating shadows and distorting the image. With "slow light particles" in front and "fast light particles" behind, or "fast light particles" in front and "slow light particles" behind the observable image in the universe is limited. Therefore, when scientists attempt to remove the so-called noise, the scientific community often overlooks the significance of "light" in this process.



Figure 3: The backlight photo from Nasa

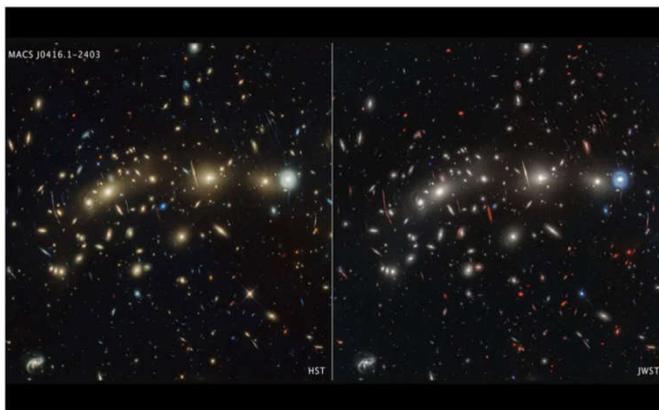
Therefore, this article aims to address a gap in scientific development. It seeks to explain current phenomena through underlying mechanisms and, more importantly, hopes to demonstrate the existence of "fast photons" and "slow photons".

As previously discussed, the phenomena of fast light noise and background light often occur when capturing images of the universe. This research paper suggests that the background light consists of "fast photons," while the noise light in front is made up of "light slow particles." By comparing strong and weak light projections, we can infer and measure the true speeds of "fast photons" and "light slow particles."

If the speculation in this research paper is correct, the speed of "fast photons" depends on the universe's curvature gravitational "lens" expansion rate, while slow photons exhibit a deceleration phenomenon under specific conditions, as if they are being pulled. Therefore, by comparing shadows (transmissions), we might be able to discover the true speed of "fast photons" and "slow photons." The true speed of "slow photons" can also be measured by comparing the intensity of the light they emit (Figure 4) (Figure 5).



Figure 4: James Webb Space Telescope captures new detailed snapshot of iconic 'Pillars of Creation'



This side-by-side comparison of galaxy cluster MACS0416 as seen by the Hubble Space Telescope in optical light (left) and the James Webb Space Telescope in infrared light (right) reveals different details. (NASA, ESA, CSA, STScI)

Figure 5: The comparison of the Hubble Space Telescope and the James Webb Telescope with the same galaxy cluster MACS0416

By comparing the two different photos, we will find that, the olds one which is photo by the Hubble Space Telescope usually have the background noise, that make the photo blur with hand. And we will find out that the speed of light has seemed to be running at a faster speed while taking the snapshot. That mean it may have some light wave-like particle running at a faster speed of the constant (c) and some moving at a slower speed of constant, so it makes a formation of the background noise. When we look at the universe structure, it is not hard to imagine and understand the situation (Figure 6).

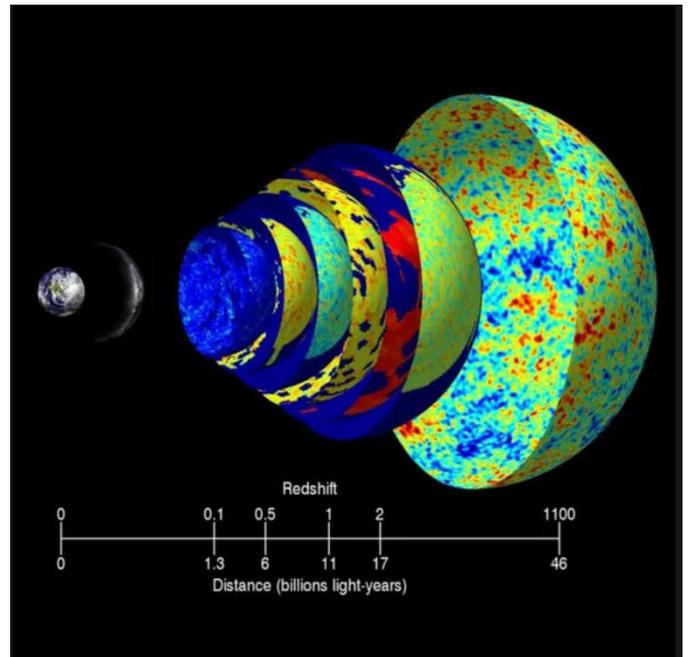


Figure 6: The formation of the Universe in the distance of light-years

It is not hard to imagine that, if utilizing our postulation to the thought experiment, light can have different speeds at various stages. We support the idea that a beam of photons remains constant, but we also keep an open attitude. We believe that photons themselves are consistent, but under certain conditions, they may accelerate or decelerate. Although photons do not influence gravity, but the curvature of the universe and the measurement event may have the potential to affect the light behavior, which could cause the speed of photons to change.

In light of this, this research paper makes relevant speculations about the points mentioned above, as explained earlier.

In summary, the five possibilities we mentioned above may occur. The first possibility, (I) Light interference phenomena, involves either constructive interference of the light wave or destructive interference (negative light wave effect). This may happen when the cosmos image is distracting, creating background noise in the photo. The second possibility, (II) Constructive interference, occurs when the light doesn't travel fast enough, causing the front of the light to form a cone shape that conforms to the later light traveling behind it. This results in a stronger light effect and a shadow when capturing an image in front of the screen. As a result, the background of the light wave is greater than the stationary image, creating a shadow image (backlight) because the background stage light surpasses the stage lighting. The third possibility, (III) Destructive interference, occurs when a negative conformal wave shape interacts destructively with the light's resilience, causing both waves to meet sharply and produce a dark, negative interference that darkens the stationary image. The fourth possible phenomenon, (IV), involves various effects on light propagation caused by the dynamic expansion of spacetime in the universe. In cosmology and general relativity, the invariant speed of light in a vacuum remains constant; however, under certain conditions, the observed speed may appear non-constant due to effects like gravitational lensing, spacetime curvature, and the universe's expansion. Additionally, local measurements of the speed of light are influenced by spacetime curvature, as described by Einstein's field equations, which govern gravitational dynamics and the universe's geometric structure. The fifth possibility, (V), relates to the wave-particle paradox, where the observed substance collapses into a state of identity. In this case, light waves may avoid detection,

and when detection is attempted, the front wave appears to travel faster, exceeding the normal speed of light ( $C$ ), as if hiding from detection. Later, when detection occurs, the waves collapse into particles traveling at the normal speed of light ( $C$ ). So, the speed of light depends on whether it is being detected or not in the cosmos. Since the universe is large enough to allow the light wave to travel through vast space, rather than just in a laboratory experiment, the speed of light is constant whenever it is measured. However, we believe that the speed of light depends on the distance it travels and the size of the space. If the space is large enough, light might have the possibility to run faster than normal to avoid detection.

In-addition we further postulate that, the random event of a wave-like particle "state" is not a random like, as our above explanation has made clear of our understanding of the universe. If the universe of the cosmos is efficient enough, then the random event is not a random likelihood, it may have a mechanism behind. Such as the avoid of the measurement. **And most importantly we postulate that, light may have some characteristics of consciousness (e.g. measurement event).**

## CONCLUSION

We suggest that possibilities IV and V are the most reasonable explanations, since the speed of light may be affected by the curvature of the universe. Additionally, there could be instances of 'Fast-light,' which travel faster than the constant speed of light during the Big Bang, possibly originating at the universe's birth. Some might also occur after the Big Bang due to the twisting effect of the cosmic layer of curvature, creating a gravitational lens effect that allows these lights to travel faster than the usual speed of light. Eventually, the constant light may be transformed by a black hole during transit, influenced by the twist effect. These transformations could align with the random walk hypothesis within the efficient cosmos theory of astrophysics, as suggested by scholar C.P. Lie [3]. So, we further purposed that the random event of a wave-like-particle (light) is not a random like, as our above explanation has made clear the understanding of the universe. If the universe of the cosmos is efficient enough, then the random event is not a random event. In-addition, by our new understanding of our universe, this research paper may have proven there may have something faster than light, it is well support by the newest galaxy and universe photo image which have taken by the James Webb.

Finally, it is hoped that this research paper can contributing both industry and mankind.

## REFERENCES

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