

# Causality Violation in Quantum, Electromagnetic and Gravitational Phenomena – Wave- Particle Duality as an Overwhelming Direct Evidence of Divine Intervention!

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## Abstract

One of the yet unsolved, simplest yet fundamental problems in physics is the question of the speed of gravitational action. It is usually formulated as follows. Suppose that the Sun disappeared suddenly. This would be sensed on Earth as a loss of gravitational pull of the Sun and as a loss of sunlight. Obviously, sunlight would disappear after 8.3 minutes. The question is: will gravitational pull of the Sun on Earth disappear instantaneously or with a delay of the speed of light? The accepted, mainstream understanding is that loss of Sun's gravity would also be felt on Earth with a delay of the speed of light. However, based on astronomical observations, some experts have argued that the direction of gravitational pull of the Sun on Earth now is directed towards the position of the Sun now, implying instantaneous transmission. Moreover, they have argued that finite speed of gravity will result in instability of planetary systems. However, another line of reasoning has also shown that this literal view of instantaneous transmission is also wrong. This paradox leads us to a profound conclusion that the speed of gravity has dual nature: light speed and instantaneous. How can this be? The new finding is that causality will be (apparently or actually) violated in gravitational phenomenon as follows. Suppose that the Sun disappeared at time  $t = 0$ . The strange thing is that the Sun will *anticipate* its disappearance and will emit zero gravitational field toward the Earth 8.3 minutes *before* its actual disappearance! This signal travels at the speed of light and reach the Earth after 8.3 minutes. This means that the signal of zero gravitational field will reach the Earth at time  $t = 0$ . The arrival of zero gravitational field at the Earth will coincide exactly in time with the disappearance of the Sun, implying instantaneous transmission. Thus, by apparent violation of causality, nature allows the speed of gravity to be both finite (light speed) and infinite. Actually, the discovery of this idea of causality violation did not emerge from investigation of the gravitational phenomenon discussed above. It emerged from a line of reasoning during investigation of quantum phenomena, such as particle interference patterns in double-slit experiments, quantum entanglement, "which way" and quantum erasure experiments. From a new insight about the internal structure and dynamics of quantum particles such as photons and electrons, a conclusion has been reached that the exact point on the detector screen of a double-slit experiment where a photon will land is completely *predetermined* by fine tuning the initial conditions of the photon and the electron during emission. This means that where exactly a photon lands on the detecting screen is completely predetermined by its initial conditions, just as where exactly a ball lands on the ground is predetermined by its initial conditions. This means that an interference pattern or any arbitrary pattern could be formed on the detector screen by (almost) infinitely fine-tuning the initial conditions of the photon during emission, regardless of whether one or both slits are open, regardless of the distance between the slits, regardless of the distance of the detecting screen. In principle, a mechanical version of particle interference patterns can be created by repeatedly kicking a ball towards a hole ('slit') in a wall, with a 'detector' wall at some arbitrary distance from the hole(s). This would require almost 'infinite' fine tuning of the initial conditions of the ball, that is initial velocity, initial direction and other parameters. The interference pattern occurred just because of infinite fine tuning of the initial conditions of the ball and not because the ball 'interfered' with itself. We only made a successful simulation, and created the pattern as if the ball interfered with itself. A supernatural football player can create an 'interference' pattern on the net by

accurately deflecting the ball from either pole. The interference pattern in the photon and electron double-slit experiment is fundamentally the same. The conclusion is that aiming a photon to a particular atom on the screen requires (almost) infinite fine-tuning during emission. This raises the burning question: WHO fine-tunes the photons during emission so that they form an interference pattern or a Gaussian pattern? The emitting atom? The light source conspiring with the detecting screen? Atoms have infinitely small intelligence as to do the infinitely complex task of fine-tuning a photon. The conclusion is that a super natural being is fine-tuning and, literally, aiming each and every photon emitted not only from the light source of a double slit experiment, but also all photons emitted from all light sources in the universe. The overwhelming evidence of divine intervention is that photons and electrons cannot by themselves behave both as waves and as particles simultaneously. LITERALLY, God has been behind all confusing light speed experiments and observations made over centuries. It has been discovered that the correct model of the speed of light is a novel, seamless fusion of ether theory and emission theory ( Apparent Source Theory ). Photons cannot by themselves exhibit this dual nature. Literally, all dualities observed so far in light, electromagnetism and gravity are possible ONLY by DIRECT divine intervention.

## **Introduction**

One of the long standing problems in physics is the question of the speed of the gravitational field. The confusion begins with what ‘speed’ means in the case of gravity. We can understand the concept of speed when referring to particles and waves. But ‘speed’ does not give sense in the case of static fields such as electrostatic and gravitational fields.

The problem is usually formulated as follows. Suppose that the Sun disappeared suddenly. This would be felt on the Earth as loss of sunlight and loss of Sun’s gravitational force on Earth. Obviously, sunlight would be lost 8.3 minutes after the disappearance of the Sun. The question is whether gravitational field will also disappear after a delay of 8.3 minutes or instantaneously.

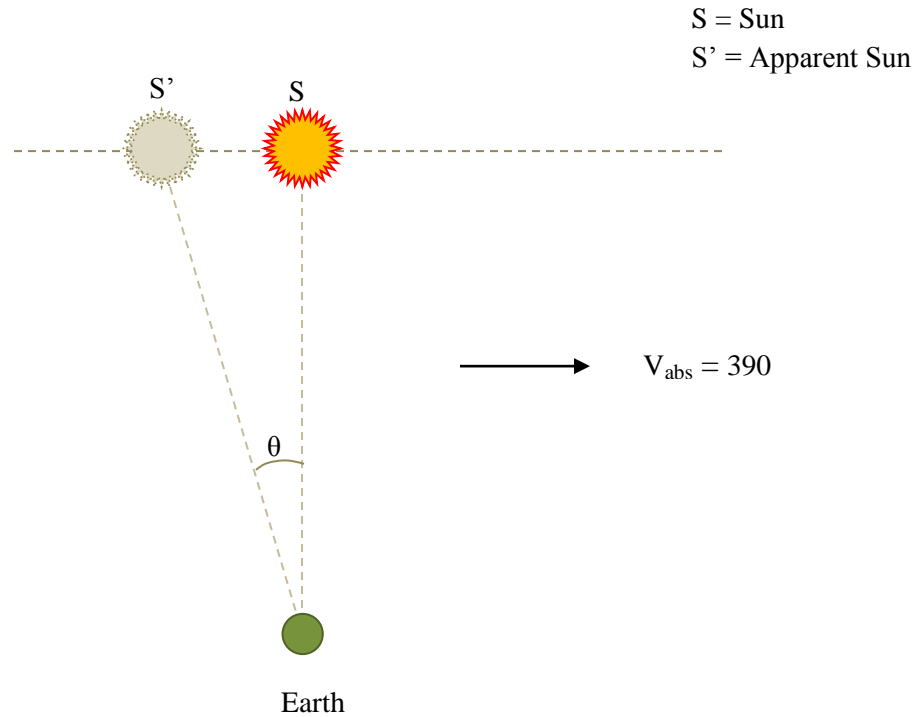
The mainstream thinking is that since the ‘speed’ of gravity is equal to the speed of light, Sun’s gravity on Earth will also disappear after a delay of 8.3 minutes. Tom Van Flandern [1] has convincingly argued that finite speed of gravity will result in instability of planetary systems. Moreover, based on astronomical observations, he has shown that the direction of Sun’s gravitational force on Earth now is towards the position of the Sun now, and not towards the retarded position of the Sun, implying instantaneous transmission of gravitational force.

However, a different line of reasoning [2] has shown that this conventional and literal view of instantaneous transmission is also wrong. The argument against this view is as follows.

### **Dual nature of the speed of gravity: finite and infinite**

We know that the Solar System is moving in space with an absolute velocity of about 390 Km/s as confirmed independently by the Silvertooth experiment and the CMBR anisotropy measurement performed by NASA. The velocity vector is almost parallel to the plane of the Solar System. For the sake of discussion, let us consider the case when the line connecting the

Earth and the Sun is perpendicular to the Solar System's velocity vector, as shown below.  $V_{abs} = 390 \text{ Km/s}$  is the common absolute velocity of the Earth and the Sun. According to Apparent Source Theory [2][3], although the Sun is actually, physically at S, it appears to be at S' and this is due to absolute motion.



The angle  $\theta$  is determined as follows.

$$\sin \theta \cong \theta = \frac{V_{abs}}{c} = \frac{390 \text{ Km/s}}{300000 \text{ Km/s}} \text{ radians} = 268 \text{ arc seconds}$$

Therefore, sunlight comes from the direction 268 arc seconds behind the current position of the Sun. Astronomical observations show that the direction of Sun's gravity almost coincides with the direction of sunlight, except for a 20 arc seconds difference due to aberration of sunlight caused by Earth's velocity relative to the Sun, which is 30 Km/s. If the speed of gravity was infinite, there would be about 268 arc seconds difference ( disregarding the 20 arc seconds caused by light aberration ) between the direction of sunlight and the direction of Sun's gravity.

Thus, from the arguments above we conclude that both views on the speed of gravity, that is the finite speed view or infinite speed view, are wrong and simplistic. The profound conclusion is that the speed of gravity has dual nature: finite and infinite. How can something have both finite and infinite speeds at the same time?

The resolution of this paradox came from a line of reasoning developed while working on the problems of quantum phenomena, as we will discuss later. The new interpretation is as follows.

*Suppose that the Sun disappeared at time  $t = 0$ . The new finding is that the Sun will anticipate its own disappearance and start emitting zero gravitational force towards the Earth 8.3 minutes before its actual disappearance. It is as if nature had a foreknowledge of the disappearance of the Sun. We assume that this gravitational signal will travel at the speed of light and reach the Earth after 8.3 minutes, that is at time  $t = 0$ . Thus, the signal of zero gravitational field will reach the Earth exactly at the time when the Sun disappears, that is at  $t = 0$ , implying instantaneous transmission. By apparently violating causality, nature allows dual nature of the speed of gravity: finite and infinite.*

### **Quantum phenomena : what is the medium for the electron wave and for the photon wave ?**

In this section we will propose a new insight on the daunting problems of quantum phenomena. How can particles ( photons and electrons) form interference patterns ? If the photon ( or the electron ) has wave property, what is its medium ? How can the “which way” and quantum erasure experiments be explained ?

Ordinary waves such as water and sound waves are travelling disturbances of their material media. If we drop a stone into a pond, a packet of circular water waves will form and travel radially outwards, with its center O at a point where the stone was dropped. Let us see what happens at a certain point P some distance away from the origin of the wave.

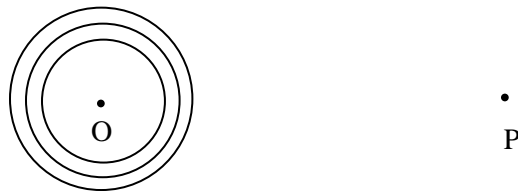


Fig.1

Before the arrival of the wave packet, the water is standing still at point P. As the wave arrives, the water molecules start to oscillate vertically. After the wave packet has passed through point P, the water molecules become standing still again. The *wave (the oscillation)* disappears from point P.

Let us note a seemingly trivial, yet key idea [4]:

*Disappearance of the water wave (oscillation) from point P doesn't mean disappearance of water molecules from point P.*

This idea is the basis of the distinction between ordinary waves and quantum waves (the photon wave, the electron wave).

At first consider the electron as a continuous field of electron mass (and charge) density field distributed continuously in space, not as a point particle. With this picture, the electron is analogous to the pond water example discussed above. Assume that a wave is created somehow in the electron 'pond', analogous to the water wave. If we assume a direct analogy between the electron wave and the water wave, the electron *mass density* would be standing still at point P before the arrival of the wave, its mass density oscillates as the wave arrives and becomes stand still again after the wave has passed through point P. But from our ordinary experience of motion of particles we know that there will be no particle at a point until the particle arrives at that point and after the particle has already passed through that point. The particle is detected at a point only when it arrives at that point. This is the crucial distinction of quantum waves from ordinary water waves.

Therefore, we need to modify this direct analogy for the electron wave as follows:

There will be no electron (electron mass density is zero) at point P before the arrival of the electron wave and after the electron wave has passed. The electron mass density disappears (diminishes) from point P with the disappearance of the wave. Unlike the water wave, the medium for the electron wave, which is the electron mass density field itself, exists at a point only when the wave (oscillation) exists (is non-zero) at that point. This means that the electron wave drags the electron ( the electron medium) with itself. Where and when there is no electron wave (oscillation), i.e. where the amplitude of the wave is zero, there will be no electron; the electron mass density will be zero. The mass density will always be concentrated at regions where there is high oscillation of electron mass density.

The puzzle can now be resolved:

“If an electron is a wave, then what is the medium for the electron wave? What is waving ?”

*The electron is both the medium and the wave.* The medium for the electron wave is the electron mass density field itself. No exotic medium is required.

The same applies for the photon. The electric and magnetic fields are the 'mediums' for the photon. No exotic medium (ether) is needed. In the case of the photon, *the medium is the electromagnetic energy density field.*

## Interference patterns in double-slit experiments

The new intuitive idea has enabled us to gain insight on why electrons and photons exist as particles and why the mass of the electron and the electromagnetic field of the photon is not spread throughout space like classical waves.

We will develop this idea in order to fully understand the mystery of interference patterns of double-slit experiments. The new insight introduced above implies that the reason why the electron (and the photon ) is not spread throughout space but localized is that the electron mass will be concentrated only at points in space where there are *oscillations* of electron mass density. The mass density of the electron will be zero at points of space where the amplitude of mass density oscillation is zero. The mathematical formulation of this intuitive idea is yet to be done, and I will not attempt it in this paper.

This shows that we need to take a deeper look into the internal structure of the electron and the photon. Imagine the electron to be like a pond water. At each point in the electron field, there will be electron mass density oscillations (fluctuations), defined by the rate and acceleration, just as at each point of the pond the water will have an instantaneous velocity and acceleration of the water molecules. According to the new theory, the electron mass always keeps flowing from points of lower fluctuation to points of higher oscillation. Considering the almost infinite degree of freedom of the electron, the internal dynamics of the electron will be complex. Suppose that at some instant of time there are multiple points in the electron (mass density) field. Due to the complex dynamics, those points will continue to change over time according to initial conditions, and points where there were high oscillations may change to be points of lower oscillations or points of even higher oscillations.

But there is also a probability (however small) that all the mass of the electron flows towards a single point, making the mass density infinite. This is what happens during detection! The same applies for the photon.

Now consider the double-slit experiment. Now, we explain the whole process from emission to detection. Let us start by assuming that an electron has been detected at point P on the screen forming an interference pattern. How did this happen ?

The source had a “ foreknowledge “ that the electron would be detected at point P and emitted the electron accordingly. From knowledge that the electron will be detected at point P, the source of the electron *fine-tuned* the initial conditions of the electron so that the electron would collapse at point P. The fine-tuning includes whether to direct the electron towards only the lower slit, only towards the upper slit, or both. Since we assumed that the electron was detected at point P to form an interference pattern, then the source has directed the electron to both slits so that an interference pattern will occur. But how can we explain the fact that the electron has been

detected at point P and not at any other point. The Copenhagen interpretation is that this is determined only by probability and that there is no physical process behind it. And this probabilistic interpretation was why Einstein never accepted quantum mechanics and, according to the new theory proposed here, he was right. The new idea is that the source, provided with a “foreknowledge” that the electron would be detected at point P, (almost) infinitely fine-tuned the initial conditions of the electron mass density fluctuations at every point ( which will also fine-tune direction of emission of the electron ) so that the electron will not only form an interference pattern, but will be detected at point P and at no other point on the screen. What I mean by this is that by (almost) infinitely fine tuning the emission of the electron, the source can choose where exactly the electron will be detected on the screen. I mean there are almost infinitely different ways to direct the electron towards both slits, infinitely different ways to direct towards the upper slit, infinitely different ways to direct towards the lower slit.

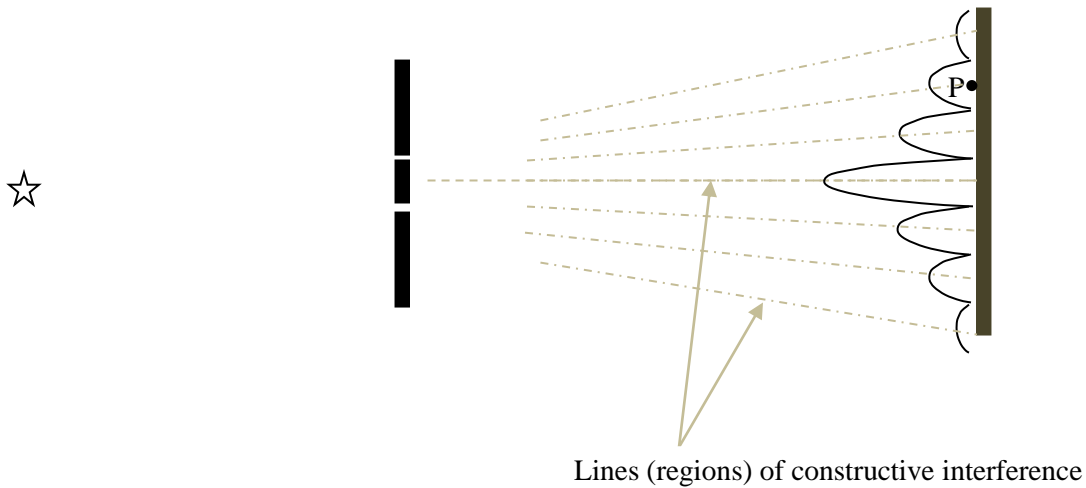


Fig.2

In summary, the source (or the universe) knows that the electron will be detected at point P and infinitely fine-tuned the initial conditions of the electron field during emission so that the electron will be detected at point P. The initial conditions include the electron mass density at every point in the field, the rate of change of mass density at each point and the *rate of rate of change of the mass density* ( ‘acceleration’ ) at every point. These are analogous to position, velocity and acceleration in a mechanical system.

Note that the source knows in advance not only that the electron will be detected at point P, but also that detection at point P will form an interference pattern and not a Gaussian pattern, in this case.

## “ Which Way “ and quantum erasure experiments, causality violation

Entangled photons, one X-polarized and the other Y-polarized, are each sent toward detectors  $D_p$  and  $D_s$ .

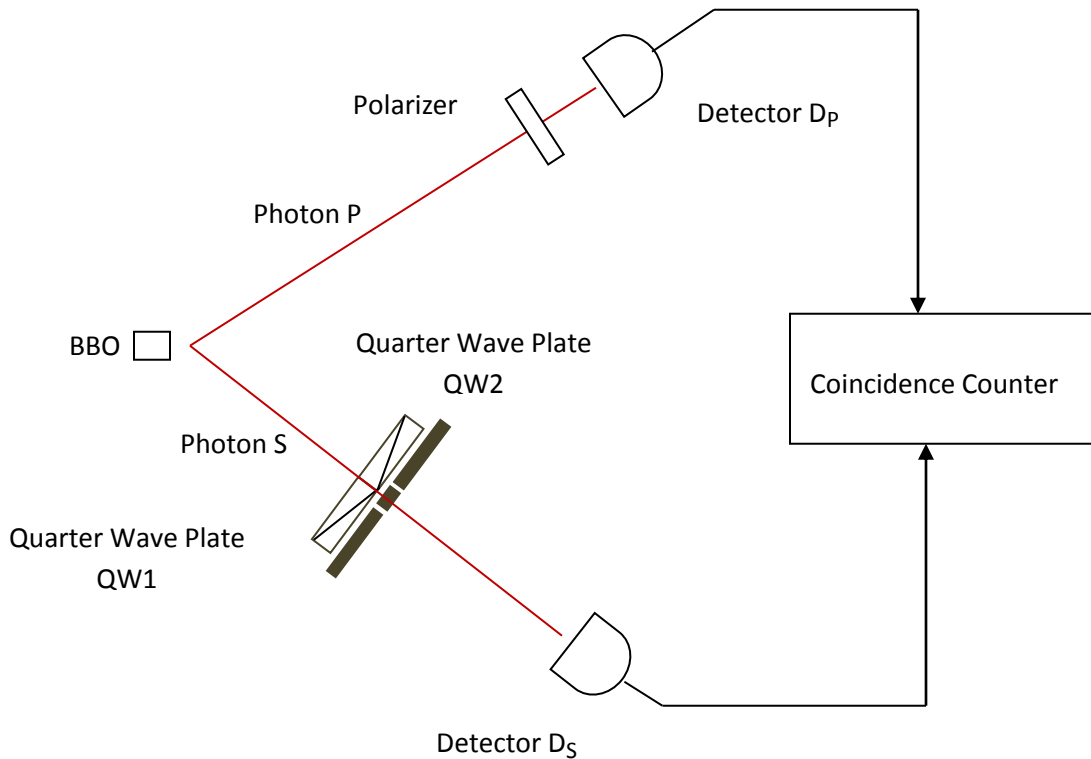


Fig.3

The experimental set up is to test whether it is possible to know which slit the photon has passed through and to have an interference pattern at the same time. At first ignore the polarizer in front of detector  $D_p$ . If detector  $D_p$  detects, say, an X-polarized wave, then the wave going to the slits (to  $D_s$ ) will be Y-polarized. From this information and information on the polarization (clockwise or counterclockwise) of the wave detected by  $D_s$ , it is possible to know through which slit the photon has passed.

The experiment has shown that it is impossible to know which slit a photon has passed through and to have the interference pattern at the same time. As mentioned above, assume that the polarizer in front of the detector  $D_p$  is not there. How can we explain the loss of interference pattern in this case? According to the new theory, the source of entangled photons (or the universe?) ‘knows’ in advance what will be the polarization of the photon detected by  $D_p$ , say X-polarized wave. Since it has a ‘foreknowledge’ that the polarization of the photon detected by



$D_p$  *will be* X, it sends X-polarized photon toward  $D_p$ , and hence Y-polarized photon toward  $D_s$ . But it also knows in advance the polarization of photon that *will be* detected by  $D_s$ , say clockwise polarization. As mentioned in the last section, the source knows in advance not only that the photon would be detected at  $D_s$  but also that the detection is not part of an interference pattern but part of a Gaussian pattern. Therefore, the source sends the photon to only one slit, say, to the lower slit so that the photon would be detected as a clockwise polarized one by  $D_s$ .

Now assume that the polarizer is put in front of  $D_p$ . We know that the interference pattern will be restored. This means that the source emits the photon towards both slits. How can this be explained? In the case when the polarizer was not in front of  $D_p$ , we know that the photon will pass only through one slit. It can never pass through both slits. This will result in a Gaussian pattern on the screen. The source fine-tunes the photon emission so that it will pass through only through, say, the lower slit. What about the case when the polarizer is in front of  $D_p$ ? Obviously, a photon detected as counter-clockwise polarization should have passed through both slits because, if this was not the case, there would be no interference fringes. The source knows in advance not only that a photon will be detected at a particular point on the screen, which would be only a partial information, but also that that particular detection is part of an interference pattern and not a Gaussian pattern. However, unlike the case when there is a polarizer in front of  $D_p$ , in which the photons are constrained to pass one hundred percent only through one slit, the probability that the photons will pass through both slits is not one hundred in this case. The interference pattern will be restored because there is a much higher probability ( say, 99.9 %) that the photons pass through both slits than only through one slit.

To further illustrate this strange idea of causality violation, suppose that the detectors  $D_p$  and  $D_s$  are one light year from the source ( BBO ), so that entangled photons emitted today will be detected after one year. The slit and all the polarizers are at the same location as the detectors. Suppose that the source emits the entangled photons, and after traveling for one year the photon arrives at the double slit. Is it possible to ‘fool’ the universe by changing the experimental setup after the photon is emitted, just before the photon enters the slits ?

Imagine that the source emitted the photon toward the lower slit by anticipating that it would pass through the lower slit and detected as, say, clock-wise polarized by  $D_s$ . Imagine that, just before entering the slit, the polarizers are removed suddenly in a fraction of a nanosecond. We know for sure that this will restore the interference pattern and suppose that the interference pattern has been restored *actually*. Can we use this argument to refute the idea that the source has a ‘foreknowledge’, by saying that the source ‘anticipated’ that there will not be interference pattern, but now there is an interference pattern ? The answer is that the source ‘knew’ that the photons would be detected so as to form an interference pattern and directed the wave to both slits so that an interference pattern would be formed. The source knew in advance how the photons would be detected *actually*. We will never be able to ‘fool’ the universe.

*The universe is programmed !*

Just imagine how mind boggling it is for a source one light year away to ‘know’ in advance at which point exactly on the screen the photon will be detected and (infinitely) fine tune the initial conditions of the photon so that it will be detected exactly at that point on the screen!

Suppose you perform a double-slit experiment by using light from a galaxy one billion light years away. Consider a photon that has been detected at a particular point P on the screen. How is it possible for a galaxy one billion light years away to aim accurately at an atom on Earth? And it is like aiming at a moving target because the atom is in continuous motion in the universe. According to our everyday experience and science as we know it, galaxies do not ‘aim’ a photon at any particular point. The proposed explanation is that the initial conditions of the photon were infinitely fine-tuned one billion years ago, at the time of emission, so that the photon would be directed towards that point. The initial conditions include the value of electric and magnetic fields at every point in the photon field, the rate of change of electric and magnetic fields at every point and the rate of rate of change (‘acceleration’) of electric and magnetic fields at every point in the photon field.

As another example, imagine again that, just before the photon enters the slit(s), both slits are suddenly covered by a mirror that reflects away the photon and the photon is directed towards a system of mirrors arranged in such a way that the photon keeps reflecting between the mirrors forever and will never be detected. One might argue that the source (‘wrongly’) anticipated that the photon would be detected by detector D<sub>s</sub> but the photon will never be detected. Again the answer to this is that the source knew in advance that the photon would never be detected, so it never emitted the photon in the first place.

Suppose that a football player is to take a penalty shot. The whole process takes only a few seconds and begins when the player starts moving to kick the ball and ends when the ball just crosses the goal line or is caught by the goal keeper. During this short period of time, both the player and the goal keeper make split second body movements to mislead each other, and eventually one of them wins. The player may win, say, seventy percent of the time and the goal keeper thirty percent. Think of the universe as the player, and we are like the goal keeper (or vice versa). The difference is that the universe will always score, one hundred percent. The universe always knows our *last* decision, rather our last action, regardless of all our attempts to ‘fool’ it.

### **Causality violation in quantum entanglement phenomena**

Suppose that two entangled electrons A and B, one with clockwise and the other with counterclockwise spin, travel near the speed of light for one year in different directions so that they are light years separated when one of the electrons (electron A) is detected to have a clockwise spin. According to quantum mechanics, the instant the spin of electron A is detected as clockwise, the spin of electron B will be fixed to be counterclockwise. How was this information transmitted instantaneously from A to B?

This is one of the reasons Einstein rejected quantum mechanics. The accepted mainstream explanation is that information will be transmitted from A to B instantaneously. However, this explanation provides no picture of the physical process involved. It sounds like accepting our ignorance of the mysteries of the universe as an ‘explanation’.

We provide an explanation for this century old puzzle as follows.

The mystery is :

*the source of the entangled electrons had ‘anticipated’ that electron A would be detected as clockwise spin and therefore emitted electron A to have clockwise spin and electron B to have counterclockwise spin accordingly!*

It is as if nature has a ‘foreknowledge’ of what will happen in the future !

We don’t know what the spin of electron A will be at the moment of detection, but nature knows. Nature knows at the instant of emission that electron A will be detected after one year to have clockwise spin, so emitted electron A to have clockwise spin !

### **Communication into the future and into the past ?**

Again suppose that the source ( Fig.3) is light years away from the detectors. This also means that the two detectors will be separated by light years. Assume that there is no polarizer in front of  $D_p$ . The two polarizers (and the slit) are at the same location as  $D_s$ .

Suppose that the source emits entangled photons and that one of the photons is detected by  $D_s$  to have a clockwise polarization. We have said that, from the foreknowledge that the photon will be detected as having clockwise polarization and at a particular point P on the screen, the source infinitely fine-tuned the photon during emission so that it will be detected at a particular point P on the screen. This raises the question: but what determines that the photon will be detected at point P on the screen? To put it in a different way: the source needs to know about the future state of the photon in order to emit it. But what determines the future state of the photon in the first place.

The deep mystery seems to be that the source communicates into the future with the detector to know the state of the photon when it will be detected, and the detector communicates into the past with the source how the photon was fine-tuned during emission. The photon is created by the interaction of the source and the detector, although the processes of emission and detection may take place at different times separated by billions of years. This is mind boggling!

The process of photon emission depends on the process of the photon detection and the process of photon detection depends on the process of photon emission. In other words, photon emission and detection are not separate phenomena, but parts of the same phenomenon: *photon creation*.

$$\textit{Photon creation} = \textit{photon emission} + \textit{photon detection}$$

Classically, a wave has objective existence once it is emitted from its source. This does not seem to be the case for quantum particles such as the photon and the electron.

To clarify this point, suppose that an atom inside a galaxy ( let us call this atom G ) one billion light years away started the process of emission of (started trying to emit) a photon one billion years ago. An atom at point P on the detector screen ( let us call it atom P ) of a double slit experiment in a laboratory on Earth starts detecting (tries to detect) the photon today. Atom G needs information from atom P about the parameters of the photon it is trying to emit in order to successfully start the process of photon emission and atom P needs information from atom G about the photon it is trying to detect in order to successfully start the process of detection.

Note again that atom G cannot emit a photon if it does not get information from atom P and atom P cannot detect the photon if it does not get information from atom G. Atom G can emit only an infinitely faint wave without getting information from atom P. Initially, atom G starts by emitting an infinitely faint wave ( because it CANNOT emit any wave of significant energy without communicating with atom P ). But atom P , which is trying to detect the photon one billion years into the future, cannot detect any wave. Atoms G and P continuously try to connect with each other and this may take one billion years. It may be that the emission and detection takes place when communication is established. Note again that atom G and atom P are separated not only spatially (one billion light years ) but also temporally ( one billion years ).

The final successful process may look like this. *After trying to emit the photon for one billion years*, atom G finally got response from atom P. Upon detecting an infinitely faint wave, atom P looks one billion years into the past and tries to get further information from atom G about the parameters of the wave, so that it will be looking for the right parameters. The two processes of emission and detection reinforce each other. Detection of the correct polarization of the photon by atom P will give atom G information about the polarization of the wave it is trying to emit, so that it will act *consistently* to emit the photon with the correct polarization, enabling stronger emission by atom G, which will enable detection with more certainty by atom P, which will enable emission with more certainty by atom G, and so on.

The key idea is that atom G must emit a photon with the *right* parameters to be able to emit it and atom P must detect a photon with the *right* parameters to be able to detect it. One way of looking at this process is as follows. Since the wave emitted by atom G is initially infinitely faint, the parameters of the wave is also uncertain. Atom G *cannot* emit the wave because it cannot 'know' its parameters with certainty. But there is a probability (however small) that atom P will detect the correct parameters of the wave. This will give atom G information about the correct parameters of the photon it is trying to emit. Without this information, atom G cannot act in a consistent way to successfully emit the wave.

The infinite *fine-tuning* of the photon (and the electron) we discussed before will be done in this process.

## Speed of light

Does the ‘speed’ of light give sense any more according to the ideas discussed above ?

We have said above that the processes of photon emission and photon detection are one and the same. Our notion of a light source emitting a photon, the photon travelling the intervening distance, and the observer detecting the photon seems to be fundamentally wrong according to the new theory.

What we understand as the ‘speed’ of light may be just an illusion. When we calculate the speed of light, we divide the distance between the source and the observer by the time elapsed between ‘emission’ and ‘detection’. According to the new theory, the time delay is the time it takes to *create* the photon, by the interaction of *emission* and *detection* processes, and these are separated not only spatially but also temporally.

But it may also be that our notion of the ‘speed’ of light is not wrong, but one aspect of duality.

## Time

In the previous section we said that:

“ *After trying to emit the photon for one billion years, atom G finally got response from atom P.* “

But we know that the process of photon emission takes only a few nanoseconds. Is a few nanoseconds at the emitting atom G equivalent to billions of years at the atom P ? But the process of photon absorption also takes a few nanoseconds. So a few nanoseconds at atom P would also mean billions of years at atom G.

## God

We can avoid all the above paradoxes such as :

- ‘ Communication into the future and into the past ’
- ‘ The source has a foreknowledge of the future state of the photon ’
- ‘ A few nanoseconds at atom G is equivalent to billions of years at atom P, and vice versa ’
- ‘ The speed of light is an illusion ’

if we assume that the photon from atom G inside a galaxy one billion light years away was infinitely fine-tuned *during emission* ( which takes only a few nanoseconds) and was aimed at an atom P on the screen of a double slit experiment on Earth. But atom P has been moving during the last one billion years. This motion includes:

- Rotation of the Earth and Motion of the Earth around the Sun

- Motion of the Solar System in space
- Motion of Milky Way galaxy, and so on

These motions may be thought to be predictable. But atom P would also have unpredictable motions. It is not possible to predict one billion years ago that atom P, which was at some point on Earth, would be used to make the screen of a double slit experiment, it is impossible to predict the motion of the screen once it is produced in a factory, it is impossible to predict in which laboratory a physicist would perform the double-slit experiment, and where exactly in the laboratory the screen (and atom P) would be placed. Yet the photon was *successfully* aimed from an atom G one billion light years away to atom P which is a moving target whose motion is not completely predictable.

The question is: who or what aimed (fine-tuned) the photon emitted from atom G ? Atom G itself ? Can a single atom be intelligent ? This does not give sense. Or by interaction of atom G and atom P ? This has already led us to paradoxes. Moreover, it led to highly speculative conclusions, with no picture on how two spatially and temporally separated atoms would ‘communicate’.

Therefore, the photon from atom G must have been infinitely fine-tuned and aimed at atom P by a supernatural intelligent being ( God ).

## **Discussion**

If a source of entangled photons acts as if it had a foreknowledge of what will happen in the future, then we may have proved God’s foreknowledge of everything scientifically. Will deep exploration of the mysteries of the universe, despite the prevailing view, eventually lead us toward God ? This is in fact a religious teaching I know already. This theory of causality violation may change the prevailing and perceived relationship between science and religion. Religion and science may unite to prove the existence of God.

## Conclusion

Our conventional, intuitive thinking has completely failed to help us understand quantum phenomena, such as quantum entanglement, the double-slit interference pattern, “Which-Way”, quantum erasure and delayed choice experiments. In the quantum erasure experiment, intuitive thinking tells us that there is no way for the light source placed at a large distance to ‘know’ whether the polarizers are there or not, so that it would ‘decide’ whether to aim the photon only to one or to both slits. To find a way out of this paradox, we considered the idea that the light source somehow had a ‘foreknowledge’ of the future state of the photon it is emitting, which also includes a ‘foreknowledge’ of whether or not there are polarizers there, so that it would emit it correctly by infinite fine-tuning.

An extremely crucial insight introduced in this paper is that the electron (or the photon) is to be seen as an electron mass density field ( or photon energy density field) and the insight that the mass of the electron (energy of the photon) will tend to be concentrated at points of higher mass (or energy) oscillation or fluctuation. The mathematical formulation has not been worked out yet. This provided insight into the internal structure and dynamics of the electron and the photon. This is the crucial insight that explains how an electron or a photon is aimed in a particular direction, by initial tuning. Initial tuning not only determines the direction of the photon emission, but also *predetermines* when and where the photon will be absorbed !

It is clear that here we are assuming the light source to be intelligent to initially fine-tune the photon. The idea of ‘foreknowledge’ of the source alone was not enough to fully understand the phenomena. So we proposed that the process of photon emission and photon detection are one and the same phenomena. The photon would be created by the interaction of the processes of emission and detection. But these ideas led us to paradoxes and meaningless or illogical (impossible) conclusions about time itself, where spatially and temporally separated processes of emission and detection interact to create a photon, which is logically impossible. Eventually we are inescapably led to the idea that an intelligent supernatural being ( God) who has foreknowledge about the positions and motions of that particular atom in the detecting screen must have infinitely fine-tuned and aimed at that particular atom one billion years ago. God has a foreknowledge not only of the motion of the atom, but also of the polarizers, and of everything. Knowing ahead that a physicist, by using his free will, would carry out a double-slit experiment one billion years later by using light from that specific galaxy, and knowing ahead the exact arrangement of the experimental setup and the exact time of the experiment, God emitted a photon from that galaxy by aiming it by infinite fine-tuning.

Thanks to Almighty God and His Mother, Our Lady Saint Virgin Mary

## References

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3. *A New Theoretical Framework of Absolute and Relative Motion, the Speed of Light, Electromagnetism and Gravity*, by Henok Tadesse, [www.vixra.org](http://www.vixra.org)
4. *Connection Between Planck's Relation and Non-Existence of Medium for Light Propagation and Predetermination of Photon and Electron Interference Patterns in Double-Slit Experiments*, by Henok Tadesse, [www.vixra.org](http://www.vixra.org) ( Note that some of the ideas in this previous paper have been refined in the current paper )