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Review Article

There are No Photons

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Abstract

According to modern physics (quantum theory and relativity), All kinds of particles are associated with waves (statistically) and all wave motions has its energy in the form of quanta. This view originated essentially from studies concentrated on the nature of light. In a previous paper, I have investigated this "Wave-particle" duality view of light and I showed that this view is originated from wrong induction and wrong deduction for light phenomena. Also, I showed that light hasn't a dual wave-particle nature. In the present essay, I'll investigate the results of such false duality view showing that the existence of such proposed quantum (photon) are not even plausible.

Keywords: Light; Wave; Particle; Photon; Quantum.

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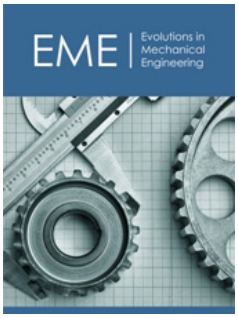

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Introduction

Come with me to another universe, the people live in such different universe are not like us, anything they see is a circle or a square, these people found a closed dark box, (yes the box is a cube, it doesn't matter now") Inside the box there is a shape as in the following Figure 1. One of these people ask himself, is the shape inside the box a circle or is it a square? He put his hand so he touched part (1), he will say to the other's this shape is not a square because I touched a curved part so this shape must be a circle (yes, if one of the two pictures is failed, he will transfer automatically to the other picture). Now if another one put his hand inside the box and touched part (2) he will say to the others; I touch a straight part so this shape is not a circle it must be square.

Some will say it's a circle, others will say it is a square, they will fight each other, or they will say this shape sometimes it behaves as a circle and sometimes it behaves as a square. Finally, these people will say; is it possible to reconcile these two shapes? (i.e. first, they will oscillate between the two pictures and finally they will Mixing them) they will say: yes, it must be a squared circle, and of course the natural result of this genius recombination is the absence of imagination. Even, if their results are very far from logic, they will find themselves forced to continue in this direction. When you ask them, why you think by this analogical way, their answer will be; it is the only game in Town [1] (Figure 1).

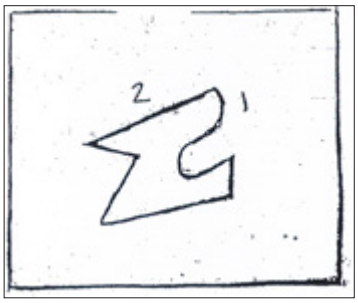

Figure 1:

It should be noted that

Despite Newton's question of whether light consists of a beam of particles or waves in motion? Is one of the oldest and the most interesting in the history of science, I think that

Newton's questions by this form is responsible for the whole disaster, it restricts all the scientific thinking after him in just only two possibilities. After Newton's the physicists oscillate between the two models for 200 years considering the wave theory is the only alternative to the particle theory and vise-versa. Finally (Einstein mixing the two untrue representations in a single fictious model).

The Developments Leads to the Duality Paradigm

A. There is a belief, the regularity of nature assumes that the future will be like the past in all of those respects in which natural laws are taken to operate. So, the universe is predictable because nature is kinder, it repeats itself constantly.

B. The universe is understandable, i.e. the physical world can be expressed in precise deterministic physical laws and a natural explanation can be found for every observable phenomenon. Physics is the science concerned with the exchange of energy between objects. Physics study the basis of the cause - effect relationship - no result without cause - everything happen according to casual law. i.e., External deterministic universe, cause and effect we can study what actually happen in any individual system.

C. In the end of the seventeenth century, it was known that light is a type of energy, also it was known that energy transfer via two ways; particle motion or wave motion, so Newton ask himself what is light, particles or waves?

D. Huygens in 1690 proposed that light propagate in spherical surface or waves.

E. Newton in 1704 treated light as rays of particles diverging from the source and travel in straight lines.

F. Single slit pattern leads to discarding the particles hypothesis, and Newton himself discovered the phenomenon of alternative, bright and dark rings.

G. Young in 1802 showed that both the double slit and the single-slit phenomena could be solved by considering light to be consists of waves.

H. Maxwell in 1865 made his general theory, of electromagnetic waves, he concluded that light is electromagnetic disturbance in the form of waves moving with the speed of light "C".

I. Heinrich hertz demonstrate experimentally the existence of electromagnetic waves as predicted by Maxwell.

J. It is become evident that light consists of waves.

K. Electrons were discovered in 1895 as particles, you could count them, you could measure its mass, charge... etc.

L. Planck in 1900, in his study of the black body radiation, made his assumption that molecular oscillator is quantized, their energy can only be integer multiple of $h\nu$.

M. Einstein during his study for the photoelectric - effect proposed that light might be pictured as particle (quanta - photons) each with energy - $h\nu$.

N. The physicists begin to consider light as Maxwell waves keeping in mind that there are situations for which this description is inadequate while the quanta description is good enough.

O. The physicists have finally concluded that the wave-particle duality is a central property of light.

P. De Broglie sensed the symmetry in nature, and he argued that there is a wave like character associated with the electrons, such that $\lambda=h/p$, he assumed that it is valid for all elementary particles.

Q. C.J Davisson and L.H. Germier bombarded a nickel crystal with electrons and showed that they bounced off at certain angles (just like X-ray do) and they showed that these angles could be calculated from de Broglie formula.

R. All kinds of particles are associated with waves statistically, and all wave motion has its energy in the form of quanta.

S. The physicists create three equivalent theories to describe this idea mathematically; Dirac, q theory, Heisenberg matrix mechanics and Schrodinger wave mechanics.

T. Heisenberg uncertainty principle and its philosophical consequences probabilities - random chances - the new quantum philosophy.

U. Everything, all carriers of energy, and momentum propagate as a waves and exchange energy like particles. The wave-particle duality is a general property of Nature.

Modern expert's quantum theorists' words

A. Current research in physics aims to unify quantum theory and Relativity in a complete theory of subatomic particles. Our goal today is to obtain a final starting equation from which the whole atomic physics can be deduced. The fundamental physics theory or the Grand unification theory [2].

B. We use quantum mechanics to analyze, predict, and understand microscopic phenomena. Here quantum theory forms the bedrock of the modem physics of matter - atoms, molecules, and solids..... quantum mechanics plays a vital role in a vast array of technological applications, some of which we use every day ...e.g.; the microchips in the computer on which I'm writing this chapter" [3].

C. Steven Hawking said "By the end of this century. We might have a complete consistent and unified theory of the physical Interactions which describe all possible observation, the foundation of that unified theory is the Quantum mechanics."

D. Some Physicists said "The nature of the photon is the measurement that we make of it. The concept of the photon is basically just what we might think the photon" looks like", while there is only one set of measurements of the photon's nature, everyone has a different concept of just what the photon might really be"[4].

E. "We can say that light is constituted by energy quanta, called photons. However, in high enough, we cannot say that

there is a wave, but only that the wave description yields the correct predictions. "It seems that ontological statement about the existence of electromagnetic wave are not so plain as in the case of photons.".

F. "Quanton" i.e. Theoretical Entities (like photons, electrons, atoms, nuclei, ...) used by quantum theoretical physics cannot be adequately referred to in terms of waves or in terms of particles. This statement is grounded in the fact that, for instance- the electron has among its physical properties not only classical items like mass and electric charge but also de Broglie's wave length.

G. Then, it is true that the electron is described by properties typical of a particle and of a wave. The concept of "Quanton" allows one to formally supersede the wave-particle duality expressed by saying that, for instance, an electron behaves sometimes as a particle and some other as a wave. In fact, once we have accepted this new concept, we can only say that "Quantons". Behaves as quantone"[5].

H. "I want to emphasize that light comes in this form - particles. It is very important to know that light behaves like particles, especially for those of you who have gone to school, where you were probably told something about light behaving like waves. I'm telling you the way it does behave - like particles; light is made of particles"[6].

I. Also, Richard [6] said to give you a feeling for the accuracy of QED, it comes out something like This; If you were to measure the distance from Los Angeles to New York to the accuracy, it would be exact to the thickness of a human hair. That's how delicately quantum electrodynamics has in the past fifty years been checked – both theoretically and experimentally.

Personal View

Those physicists whom mentioned above have tried to convince us that when we study quantum physics, we should regard it as a Fundamental truth, and when we study the dual "wave – particle" nature of the proposed quantons that means that we are dealing with a fact of life we must live with. t. So I found my self-forced to remined the reader with the following methodological principles;

A. There is no fact in science, and that all scientific knowledge is in principle subject to change as new evidence becomes available [7].

B. The fact that even the predictions of a theory is in complete agreement with experiment. This is does not implies that, in the world, things go exactly as described by the theory.

C. It should be noted that, Constantin Meis, wrote in his book: "light and vacuum"; today we perfectly, understand the behavior laws of light but our Mathematical representation of its wave – particle nature and its relation to the vacuum is still incomplete.

I investigated the following questions

A. Does the exact nature of light is, somehow, between the state of being a wave and also of being a particle?

B. Is it true that light consists of group of photons associated with a wave as the physicists said?

C. I asked what does they mean by the word "associate" in precise physical interpretation,

D. I asked what is it means that it has no definite size and what is λ, wavelength of what wave? and is this wave a real wave, i.e. is it part of external nature? Or is it a mathematical device? And in such case how it effects or guide the motion of such photons?

E. And I wondered how the energy of that proposed localized photon depend on non-localized property as the frequency.

I didn't find a convincing or reasonable answer for any of this question

First: I clarified before that; the world-wide acceptance of the duality paradigm is not because it is true, but because it becomes so familiar long enough time. Now I will show that there is no existence for such light quantum: Physicists said that the photon is a concept that developed just for the sake of an important discovery like the photo electric effect, they said [4] "... Einstein had no choice but to introduce the concept of photon" in order to interpret such phenomenon. I say that there is no any physical ontological significance for these proposed photon because physics is the science which study the entities of nature, for example there is no picture for the proposed photon (as the fundamental unit of light) could explain how the energy contained in such localized packet depend on non-localized property as the frequency, which directly means to me that there are no ontological existence for such theoretical entity in nature - I'm in need for a mental picture (image) to give me a visual imagination of these unseen entity i.e. analogy to a known system [8].

I'd like to say that; since the number of geometrical figures is infinity, because the mathematical proportions have an infinite number. Thus, it is impossible that we cannot fined, a form (a picture) corresponds to every entity in nature. In my own view our failure to obtain a picture for that proposed photon (which has no definite size) is not due to present lack or deficiency of imagination, the Real reason is that the photon is a word for contrary properties, these properties couldn't fit together, could not constitute a picture, so logically it cannot be, consequently it has no real ontological existence, subsequently there is no necessity to create a name for contrary descriptive competency [9]. Our failure to find a picture for that theoretical concept is that because it's a word without peer in nature (contrary descriptive componence), its falseness lies in its interior structure.

If you ask me why you refuse to accept the contradiction aroused in the photon concept, well, my answer is the following; This is blue box, we have another different color box. This is not blue box, we will agree to call it green box. By this simple way i.e. because this box can't be blue and not blue at the same time [10]. I can say that; The law of non-contradiction is the basis of making distinction, consequently without which language would not have evolved. Einstein succeeded in solving the photo-electric effect by

his unimaginable photon, yes, he succeeded on the short run but on the long run he transfers physics to become a blind sciences**.

For those physicists who said that they are measured the energy and momentum of that proposed photon, I say that this situation is like Maxwell situation when he measured the properties of Ether (such as its Rigidity) on his days, however, today every physicist knows that there is no ether, the ether assumption is gone. Now days we know it is not a valid concept [11]. I found myself forced to reminded, the reader with the following methodological principle which states that; we can measure the physical quantities associated with a theoretical entity without having any reasonable basis for attributing a real existence to that entity–the photon is a theoretical entity hasn't any real ontological existence in nature, its ontological existence is not even plausible [12].

I found myself forced to say the following "up till now all what we got are useful illusions, but I'm not surprise because the present day physics leans toward prediction and application at the expense of explanation and understanding, and that the photon such theoretical entity in only a product of historical superposition of different layers (theories and images of the world, and I am sure that it will be superseded (sooner or later) by a new insight [13].

Second: To avoid the previous problems, I found myself forced to create a new theoretical description for light propagation form (a new light model). However, my model was still not in a satisfactory state, because I'm not acquire (I don't have) the required mathematics need it to describe that model quantitatively. For those whom saying that physics is the science of measurements and mathematics is the language of measurements, you didn't introduce any new mathematical shame. All you have are just "words" [14]. My answer is, please remember Michael Faraday in his Researches he developed a detailed theory of electromagnetic induction without writing any mathematical formula.

Physicists have two main questions: How one will interpreter that the double slit pattern that are built up spot by spot.? How I think that these spots are not a direct demonstration of the particle nature of light? the answer is; my wavy rays have a front area w, it produces such spots on the screen like factious quantum corpuscles or photons.

How do you interpreting that the Maxwell's theory of light is valid only when the number of photons is high enough and my answer is: When we have (commutative propagation of a large number of wavrays (side by side), they will finally constitute (or they will be equivalent to) a spherical surfaces with periodic phase (wave), that is why this behavior can be explained by the wave-theory of light (acts as spherical wave) [15].

Finally; It should be noted that; concerning what the physicists called "The wave nature of fundamental material particles "I would like to attract your attention to realize what actually happened: Davisson and Germier were interpreted the results of their experiment essentially as classical electron scattering. However, after the Broglie made his mistake $\lambda=h/p$, (i.e. extending the untrue duality view from light to matter), then the eminent European physicists suggested them to change their interpretation from classical electron scattering to Modern electron diffraction instead, they did so, and they received Nobel prize for that change. They got paid - yes Nobel prize committee Misguided the whole scientific enterprise [16].

Final words: The physicists say the ontological statements about the existence of theoretical entities are only plausible and since ontological statements are the building blocks of images the world that guide us in our daily life, the experimenter in his laboratory and the theorist in the elaboration of his theories [17]. And since the ontological statements should be based on the acquired theoretical and experimental knowledge and compatible with it.

I can say the following

The photon assumption is in conflict with our theoretical knowledge: Because according to "Aristotle" we are governed or ruled in the real world with the fundamental notions of formal logic, which include the law of non-contradiction which states that; it is not valid to affirm A and-A (at the same time), consequently it is not valid to say that the photon is localized packet, and its energy depend on non-localized property as frequency, that is because if the photon is a localized packet, then all of its characteristics, will depend on localized properties-and if the photon is non-localized entity then, all of its characteristics will depend on non-localized properties-and nothing in between [18].

The photon assumption is in conflict with our experimental knowledge because: The dilemma or the puzzle of the double slit pattern when the light is so faint, such that the proposed photons coming one by one;

A. Physicists cannot say that some photons passing from the upper slit, and some others passing from the lower slit because they cannot obtain this pattern by closing one slit and open the other and vice-versa with equal time intervals, in such case we obtain two single-slit patterns. (Unless you can attribute some intelligence to the photons which is able to know whether the other slit which it did not pass is open or not) [19].

B. Physicists cannot say that each photon goes partially through both slits, because this is implying that the photon energy is split and according to the quantum view.

The light should change its color as it passes through both slits and this is never happening in laboratory.

From the photonic point of view three is no solution for this dilemma

A. Richard Feynman warned us, he wrote; "don't keep saying to yourself, if you can possibly avoid it; "but how can't it be like that?" because you will go "down the drain" into a blind alley from which no body has yet escaped. No-body knows how it can be like that" [20].

B. Yes, Richard [6] himself who described it as "the central mystery" of quantum theory ... he wrote "No body understand quantum mechanics" (The character of physical low).

C. I asked; is it hard for you to admit that light does not consists of photons)? I declare that : Light is not a group of photons [21-23].

Warning

Finally, I would like to warn the physicists; if the physics scientists insisted and decided to continue in studying light using the wave and the particle theories, i.e. thinking within the wave and the particle languages (which made us unable to understand neither light nor matter). I warn you, I tell you, brother's, you got addicted running on the wrong track.

Conclusion

I showed that the photon assumption is incompatible (in conflict) with our theoretical and experimental knowledge.

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