FOURTH LAW OF THERMODYNAMICS TO EXPLAIN WAVE-PARTICLE DUALITY AND THE DELAYED CHOICE QUANTUM ERASER EFFECT

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Background.

It is an established view in the field of Quantum Mechanics that quantum waves change form to particle form when detailed observations of the quantum wave are attempted. This phenomenon in quantum mechanics is referred to as *wave-particle duality* and is a bizarre observation that lacks a logical explanation. E.g., there is no proven supply of energy in the wave-particle duality experiment that may explain the excitement of the quantum wave. Since no such energy is supplied, the excitement from wave to the unstable particle form is an enigma to the quantum community.
A second set of bizarre observations done in the same field is referred to as *Delayed Choice Quantum Eraser effect*. These experiments indicate that the quantum world knows in prior that an attempt is being made to observe it. Alternatively, that time is moved backwards after the observation has occurred. This so-called Delayed Choice Quantum Eraser effect is known to be even more bizarre than wave-particle duality. This since the movement of time might be involved to explain the behaviour, which is a bizarre event to humans.
My version of a theory of everything was launched in 2010. It is an extension to the Second law of thermodynamics which merges the concept of life with the physical universe, in which both "worlds" need to follow a common universal law expressed as; *Eu -> 0 -> Paradise*. If valid this theory of everything must be called the *Fourth Law of Thermodynamics*. Since it naturally belongs as the latest member in the family of already established thermodynamic laws. This means that other theories are given the same name until one version has been declared the official version in the scientific community.

Fourth Law of Thermodynamics.
Fourth Law of Thermodynamics (4'th law) uses its interpretation of Nash equilibrium to merge the mental content in life with the state of the measurable physical universe. That is, the theory interprets Nash's equilibrium points to describe mental solutions made by life which lowers the physical universes energy states the most. Further, that this pattern of reward has systematically given good traits fitness- over evil traits, slowly during 4 billion years of selection in a chaotic context, with limited mass-energy. A context that stems directly from the fact that the universe is a place with limited mass-energy. This is the foundation behind the Second law of thermodynamics and entropy. We can see the result of this struggle in lifeforms on our own planet. Even though we may take it for granted, it is hard to find evidence for evil traits to have accumulated domination over good traits in nature. 4'th law explains this simply by saying that evil traits consume more energy than good traits. Hence, in a context with limited energy and hence chaos, evil traits must lose to good traits, due to this universal law.

As a result, for the law to work life must compete in a chaotic context, which ultimately is produced by a state with limited energy. Since the universal system is such a place, as proved in the Second law of thermodynamics, the theory suggests that the universal goal for lifeforms in its system, is doomed to continue to enhance good traits over evil traits. Even though such lifeforms can reverse the prime mover - energy context, in which it thrives. And this is where this third article in the 4'th law series comes into play. In that, the universe should have a mechanism to protect itself in those stages where universal lifeforms become so advanced that they are able to reverse the law, by reversing the energy context to constant abundance of energy - and consequently put the *Eu -> 0 -> Paradise* law to rest. This since, Nash's equilibrium points should

lose their potency as soon as all degrees of chaos are removed, due to the removal of the limited energy-mass state. According to 4'th law these things belong together, as energy context is viewed as being the very first prime mover in the struggle between good and evil traits, working on all types of universal lifeforms. That is, if the end-result of this universe was predestined to end in a state of 100% love and intelligence. The architect behind such a law for the universe should have a plan to detect and solve such an unavoidable scenario.

Based on this, my theory of everything offers a possible explanation to *wave-particle duality* and the *Delayed Choice Quantum Eraser effect*.
Fourth Law of Thermodynamics suggest that both bizarre observations, time delay and wave-particle duality, in the quantum world, is traces of a universal function that are meant to detect and eventually to handle lifeforms in the universe which 1. Thrive and strive to create a context with abundance of energy in which it can compete, and 2. Strive to use this new opportunity to remove chaos. If this theory of everything is a valid one such lifeforms should be a direct threat to the universe due to its Eu -> 0 -> paradise purpose. It should be crucial in its architecture to detect and hinder a continuation of such lifeforms anywhere in the universe. All stemming from a universal law which only purpose is to guarantee the irreversible universal reaction Eu -> 0 -> Paradise to go to completion, over Eu -> ∞ -> Hell, which would be a natural consequence if the strive to turn the prime mover on its head never can be stopped. The main argument in this paper is that if not stopped, the architect behind the universe would probably end up in hell. That is, relative to this architects' own ego and my argument is that the universe does seem to have one.

By having built in a mechanism that are able to detect *intelligent intent* in all lifeforms no matter the energy context, or the degree of chaos - nature should be able to be informed that it is about to lose the struggle for survival - anywhere in the universe. I argue that traces of such a mechanism is what is observed in both bizarre observations; *wave-particle duality* and the *Delayed Choice Quantum Eraser effect*.

Results and Discussion.

Wave-particle duality.
Quantum fields are excited from wave to particle-form when it experiences a pre-set level (a quantum level) of energy, as is the case in all quantum levels of elevated energy states. The wave becomes unstable and changes form at a pre-set energy level. As shown in figure 1 the wave pattern on the backscreen disappears as an attempt to observe the photon is attempted.

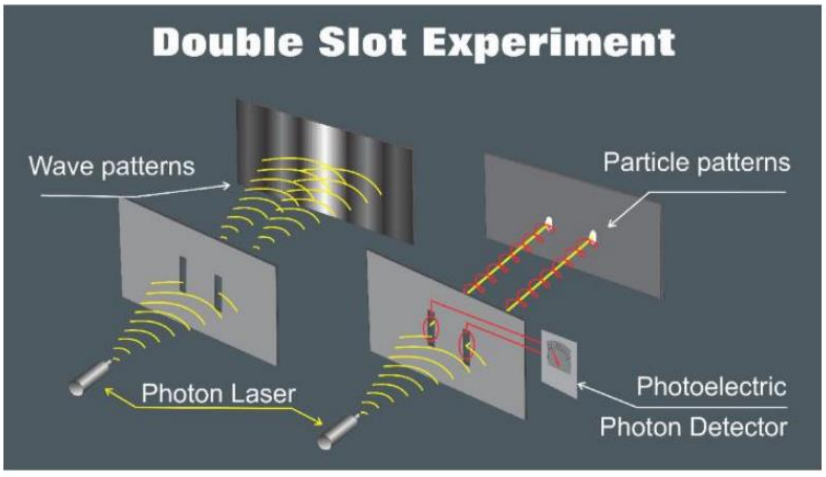

Figure 1. Illustration of the wave-particle duality experiment.

Since there are no energy supplied to excite the photon from wave to particle form, the observation is referred to as being a bizarre one. 4'th law suggest that its basal principles are what excites the quantum wave- stemming from the intelligent intent behind the observation.

Fourth Law of Thermodynamics proposes that the energy state of the universe is directly connected to all intelligent intents across the universe and thus should always be instantaneously available to the universe. In this case the standard for what is perceived as evil intent (elevated energy state), or good Intent (lowered energy state) should also be standard- pre-set quantum levels of energy states to the universe. As if it uses its sensitivity towards changes in universal energy states as a means of communication. Such pre-set standard levels are probably also in play when the universe constantly regulate molecular conformational states across the universe. Such form of energy-level communication could be what we observe in the bizarre quantum mechanical experiments mentioned. When we try to observe the universes smallest components it closes, it reacts dramatically by changing its form, from wave to particle. According to 4'th law this is solely based on its sensitivity towards intelligent intent directed towards itself. Communicated via its extreme sensitivity towards disturbances in universal energy states.

The fine-tuned standards for where the quantum world does not- or do- excite the quantum waves when being observed does not necessary mean that humans have evil intent while exploring the universes smallest components. Just that the observer at the time does not live up to the universe's standard for goodness, being allowed for further exploration and knowledge. On the other hand, if life can reverses the logics in 4'th law (by removing the prime mover as have happened in some parts of the modern world) such a quantum barrier could function as a security barrier, or an alarm system for the universe, at the quantum level. And the universe could by such a communication system stop lifeforms that has tricked the prime mover barrier, and continued to develop evil traits, which goes beyond the universes standard for "friend" or "enemy" (a direct threat).

On one hand, by responding to intelligent intent on the quantum level the universe do prevent lower life forms gaining further knowledge of itself. Until these lifeforms are so good that their measured intent no longer increase the universal energy state enough to change the quantum form. On the other hand, such a sensitivity towards intelligent intent could be a means to detect zero-risk strategies in universal lifeforms. Zero-risk strategies should at some point become available to life which has been able to remove the prime-mover barrier, as the new energy context on the macro-level (abundance of energy to compete in) hinders Nash's equilibrium points further potency, to separate good from evil intents.

In summary, the universal function behind the closing of the quantum world as we try to observe it, could according to 4'th law be to guarantee the universal irreversible reaction Eu -> 0 -> Paradise to go to completion. 1. By stopping further exploration and 2. To be informed as lifeforms are being able to compete with zero-risk strategies in the struggle for survival.

Delayed Choice Quantum Eraser effect.
The quantum community could not find any other reasons to the wave-particle duality phenomenon, other than- it was the observation itself that triggered the formation of the unstable state (which 4'th law do agree). The new experiments which tried to hide the intent to observe- did manage to do so, in that the quantum particles had no chance to know about the observation- until after their passage beyond the slit filter. That is, the decision to observe was made after the particle had passed the filter (figure 2).

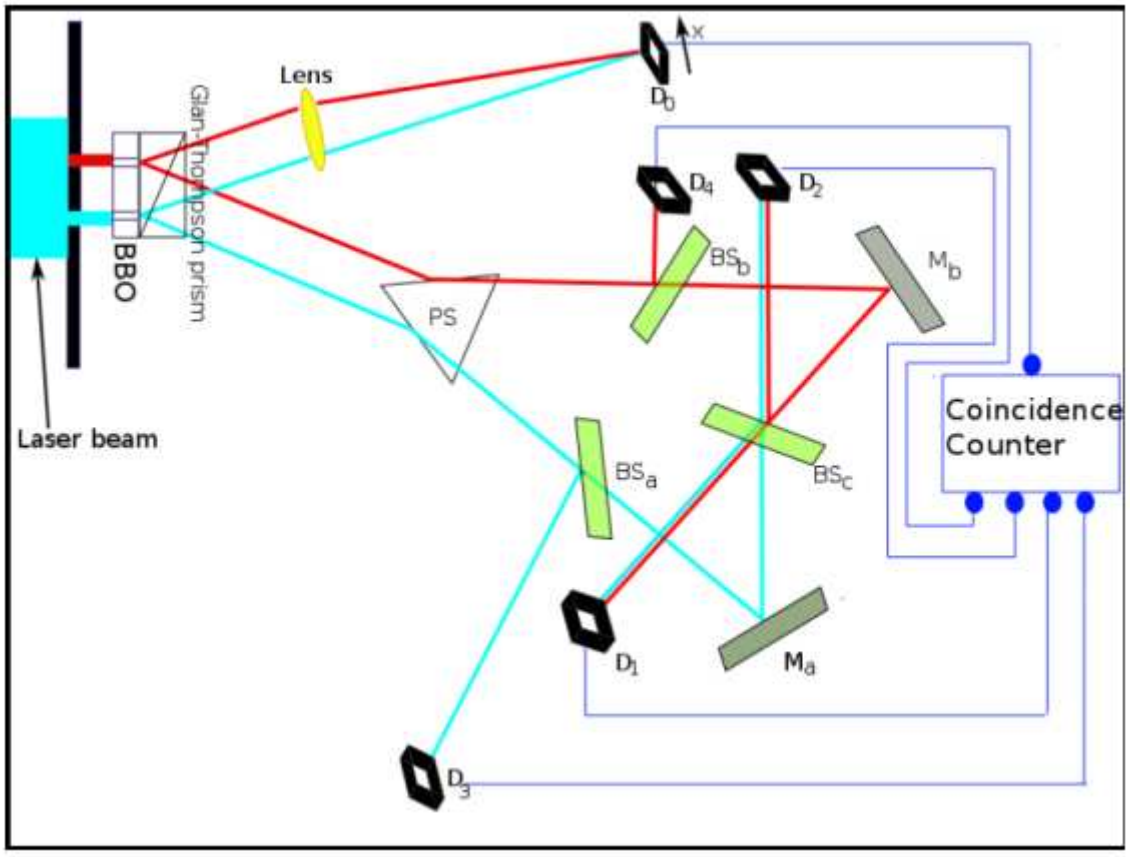

Figure 2. Many experiments have tried to surpass the excitement of the quantum world found in wave-particle duality by delaying the decision to observe.

The result has been an even more bizarre observation, the Delayed Choice Quantum Eraser effect. Somehow time seems to be reversed in the quantum world to hinder observation. As the decision to observe had not yet taken place before the quantum wave passed the slit. The conclusion of these experiments was even more strange than wave-particle duality. As the particles still were unstable (excited to particle form) before decision time- the quantum particle knew about the decision. In conclusion, an even more bizarre phenomenon was discovered, the Delayed Choice Quantum Eraser effect. The quantum world appeared to have reversed time itself, alternatively; to have pre-knowledge of the intent to observe. Again, 4'th law would explain this even stranger observation from the same logics it explained wave-particle duality. The means of communication, or the means of how the quantum particles got excited and unstable, will according to 4'th law go via the universes sensitivity towards energy states- as it was disturbed by the intent towards itself. As the universe's sensitivity towards energy states communicates instantly across the universe (e.g., it must be how the universe is able to regulate all molecular conformational states instantaneously- across the universe). It must mean that the speed of light will appear as slow-moving in comparison, hence movement of time for the human observer suddenly has an opening. Without pointing to the exact mechanism to how the universe manages to escape the delayed observation attempts, it suggests that it has something to do with the speed in which 4'th law detection process operates at (energy state sensitivity).

Einstein and his $E=M \cdot C^2$.
On that speculative note, Einstein's work and thoughts surrounding the themes; theory of everything, time, and quantum mechanics, find its natural place in this article. First, because Einstein was very occupied with quantum physics and in particular the bizarre observations

mentioned in this article. That is, I suggest that a potential familiarity can exist between 4'th law and Einstein's mass energy equation $E=M\cdot C^2$. This is also brought up on a very speculative note in the main article from 2010. The approach is to imagine the situation according to Einstein when the irreversible Eu -> 0 -> Paradise reaction one day goes to completion and achieve final universal rest: Eu = 0 = Paradise. How will such a scenario affect $E=M\cdot C^2$? In this scenario $E=M\cdot C^2$ must be rewritten to yield just one component, which is C^2. As both universal mass and energy at that final stage does not exist anymore. It is therefore tempting to replace the phrase Paradise with the constant C^2. This since C^2 describes light in a particular state (lights speed squared). Not that it will change the conception of 100% love and intelligence, or paradise. But it will give the paradise expression a more precise physical description, a mathematical constant which compacts the formula even more. If so, it means that Einstein was closer to the theory of everything than he might thought. Since he obviously did not lack good imagination, he could very well have discovered 4'th law in his work if; 1) He had met and hit it off with John F. Nash at Princeton university at the time Nash developed Nash equilibrium. As I have learned Nash was eager to meet with Einstein to discuss his work on governing dynamics, but he was then an unknown student at Princeton, while Einstein was world famous at the time. Such a meeting could have directed Einstein towards thinking in the direction of thermodynamics. 2) If Einstein had a broader interest in studying biology and placed life as an active component in the universe faith (life as a catalyst to fulfil the Second law of thermodynamics). If 4'th law one day shows to be a valid theory of everything- these two minor events could very well be what separated Einstein from reaching his life achievement, but he came very close with $E=M\cdot C^2$, if 4'th law is valid that is. So close that his constant C^2 one day might be a part of the formula Einstein searched for until his death: Eu = 0 = C^2 (theory of everything). The resulting two versions of 4'th law describes the same universal ending as in, Eu = 0 = Paradise. But the C^2 version of it, Eu = 0 = C^2, now could give us more specific information about the phrase "paradise" in the original version.

Joseph Fourier.
If the integration of Einstein's energy-mass equation with 4'th law is a universal valid one, it indicates that paradise is a place related to waves- since light is waves. Hence "paradise" according to 4'th law should be a place related to waves by integrating Einsteins work. By applying the work of Joseph Fourier paradise now should have the necessary building blocks, *waves*, to construct all other forms in a mathematical format. This gives the integration of Einstein's energy-mass into 4'th law a new level of interest. It means that the world as we see it in theory can be reproduced in a mathematical format - by just having waves as building blocks. The last step to give modern humans the concept of "eternal paradise" realism is to copy memories and thoughts into this mathematical wave-format. The state, Eu=0, could by implementing Einstein and Fourier's work become a true copy of this physical world - in a mathematical format, constructed with waves. A paradise with no mass which will make it last forever with constant mathematical perfection. By adapting our copied memories and thoughts into this format, we should be able to feel and experience this paradise as well in the same way we are adapted to experience the physical world.

The second article in this series; "A new view on dark energy and the expansion of the universe" from 2011 uses 4'th law to explain the ever expansion of the universe - due to the ever-expanding levels of love and intelligence other places in the universe. This article suggest that what causes the expansion of the universe is expanding higher life forms which are evolving exponentially as described by 4'th law in the first paper. These lifeforms should be able to make possible the last step mentioned; to copy memories and thoughts existing on this planet and move them into the mathematical format just described. In many ways this would be the last puzzle in the ideas regarding this article series version of 4'th law. Starting in 2010 by describing the existence of a paradise, and now ending the series with an explanation of how to get there.

Conclusion.

A possible explanation to the bizarre observations done in the field of quantum physics; Wave-particle duality and Delayed Choice Quantum Eraser effect- is launched based on the logic's presented in the article-series on my version of Fourth Law of Thermodynamics.
The bizarre part in Wave-particle duality and Delayed Choice Quantum Eraser effect is that there is no supply of energy to explain the excitement of quantum waves to an unstable form. Fourth Law of thermodynamics can explain such a hidden source of energy from its universal energy logic's, which is directly connected to intelligent intent. That is, a mechanism of how the universe sense intelligent intent in all lifeforms, communicated via universal energy states. Hence, the universe, and thereby the quantum world, should be able to sense and separate good from evil intent, in all intelligent lifeforms, and especially when the intelligent intent is directed towards itself – which is the case in the Wave-particle duality experiment.
The speed in which the universe can communicate, via energy states, is probably at instant speed across the universal system. This could explain the even greater enigma; Delayed Choice Quantum Eraser effect.
The function to this quantum behaviours could be a means of communication. As this function continuously can inform the universe, at the quantum level, of evil intent in its system, after Nash equilibrium points has lost its potency due to removal of prime mover (energy context). A means to detect zero-risk-strategies in all universal life forms, as the energy abundance on the macrolevel hinders Nash's equilibrium points further potency, to separate good from evil.

Einstein's work in this field, and in the field of theory of everything can help to fill in a new puzzle in 4'th law. By integrating Einstein's $E=M\cdot C^2$ with 4'th law the phrase *paradise*, or the description of 100% love and intelligence can be replaced with the constant C^2. This integration of 4'th law with Einstein's work will give a more compact way of writing 4'th law ($Eu = 0$ = Paradise); $Eu = 0 = C^2$. To give the phrase paradise a constant C^2 in which describes waves opens a second logical bridge to how a realistic world like eternal-paradise could be constructed in a mathematical format, by implementing the ideas of Joseph Fourier.

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