Article

Consciousness &the State of NOW – Instantaneity Space

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Abstract

It is well recognized that conscious humanity exists in the past, present and future. On this, it is further recognized that once the future arrives, it immediately becomes the past. So, in reality, humanity only exists in the present. Therefore, conscious humanity can be said to exist, function and survive in only: A NOW-time or a NOW-State or in NOW-Space. By assigning real (flowing) Earth-time as a (calculus) **integral** quantity, we can easily interpret NOW-Space as being the (calculus) **differential** of Earth time. This concept is further developed by assigning a "dimension" to the NOW-Space condition as being dN/dt where N is an action event or process per instant of time, dt. The concept of NOW-Space is found to explain the speed of light's constancy as well as other types of physics phenomena such as entanglement and quantum tunneling. The NOW-State concept is finally applied to the situation of human consciousness to the extent that it is believed that all human consciousness events reside in the NOW-State.

Keywords: Time, entanglement, light speed, tunneling, dimensions, human consciousness, now.

1. Introduction

Among Albert Einstein's many notable quotations, one stands out referencing his thoughts about TIME:

> *In a deterministic world, there is in fact no real distinction between past, present and future. Time is a kind of parameter marking where we are along the temporal tramline, but with no real significance, since there is no real change, only rearrangement.*

There exists a universal, human consciousness situation which can be used to define our **real** state of existence. For simplicity, let's call it the "*NOW*-State" in time. The supposition here, is derived from the fact that the time-line for all conscious human activity is referred to as the Past, Present (NOW) and Future. Factually, though, once we timewise enter the future, it immediately becomes our past. In reality then, the only time condition witnessed by conscious humans is the Present or the State of NOW. We can thus acknowledge that we all live in a flow of "Earth-time" composed of a continuous replenishment of Present or NOW moments.

Our Future therefore, represents a frontal time-line encountered by conscious humans during their lifetimes. This frontal time-line is dynamic and forms the roots of what is known as

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functional consciousness [1]. The past is unchangeable and stores itself in the realm our historical experience. It is understood that our immediate future can be somewhat directed by our desire to accomplish something and following through. Therefore, we can plan our immediate future (what do we plan to do this afternoon, tomorrow, next week) by conceiving, planning and implementing. However, the longer away our present NOW (time-line) is from our what we plan in the future, the less certain our future becomes. As time progresses, contingencies or events crop up that may require plan changes.

Realistically, then, while major plans for the future can certainly be made and implemented (with as-needed relevant changes along the way), it's the intricate details of our long-term plans that are always in the realm of the unknown. So, on a human (planet Earth), time-scale, the **Past** is history (there's nothing we can do about it) and the details of any **Long-Term Future** will always be uncertain. In conclusion then, the only certain real-time state of human consciousness and existence is the Present or NOW state. As alive human beings, will live, breath and consciously function only in this Present or "NOW" state of existence. Our living as a human being consists of breathing, thinking, speaking, implementing or otherwise functioning along a continuous collection of contiguous transient instants that flow with time; NOW time. In reality, it's the only recognizable condition of time that is physically witnessed by conscious humans. With this as background, let's now delve into some more specific details about this "NOW" State.

The existence of a fifth dimension in physics has been a subject of speculative study since 1921, when the theory of Kaluza and its later 1926 extension by Klein were first published. In these works, as described by Chuba [2], Kaluza showed a means of adding a 5^{th} dimension to Einstein's relativity theory in an attempt at unifying gravity with electromagnetism. Klein later showed that it was possible to explain the unique charge of an electron by assuming the particle was free to move in its own time and space. Furthermore, it was possible that electrons would get trapped in this other physical dimension and become unavailable. So far, this Kaluza/Klein dimension has never led to any breakthrough insights in physics. Continuing, though, extra dimensions have been proposed in the context of what is called string theory; a supposed "theory of everything".

String theory interprets physical matter in terms of being a mass of tiny, individual "strings" or elastomeric bands, whose frequency of vibration gives matter it's unique properties. Here, seven and up to eleven extra dimensions have been mathematically shown to be needed to describe this "String Theory Universe". It is said that these string theory dimensions are "curled-up" into sizes much smaller than that of an atom's nucleus and measurable in units of ultra-small Planck lengths (1.6×10^{-35} cm)[3]. In practice though, these string theory dimensions can be considered to be no more than an extension of our present, classical x-y-z space dimensions; they differ only in size and observability. Actually, then, I don't consider these proposed string theory dimensions in the realm of a "new" dimension since they seem to be only a variation of our present classical x - y- z space unit dimensions.

From here, it would be relevant to try to interpret our proposed "NOW" state or space in terms of another definable universal dimension. If this would be possible, we might be able to interpret

this "NOW-Space" in terms of describing some aspects of our functional Universe in a new way. On this, could we possibly describe NOW-Space as being the (calculus) **derivative** of existing (present) Earth-time? What we're getting at here is to first assume that "real" (flowing, existing) Earth-time can be described as a calculus **integral** quantity. From here, we can take the (calculus) **derivative** of this Earth-time and let this define what we have already called NOW-Space. This proposition can be described by the following mathematical notation:

$$\underline{\text{"real" Earth time}} = \int_o^\infty N dt + \text{C} \quad \text{and} \quad \underline{\text{"NOW-Space"}} = \text{dN/dt}.$$

This notation interprets "real" Earth time as an integral quantity (where C is the integration constant) that can "flow along" from now to eternity. As the derivative of real time, the proposed NOW-Space quantity can therefore be considered to be an incremental component of our real time. It's dN/dt moments of NOW time that continuously flows along as the derivative of the real integral of time. It's like breaking up "real" time into a series of quantized elements. This being said, can't we now say that the NOW state has dimensions of N (functional processes) per short (infinitesimally small, almost zero) time or dN/dt? Let's adopt this definition of NOW-Space and see where it takes us. Following then, in this document, we will apply our new "state of time" parameter to explaining some of physics' well-known truisms such as the realization of light's speed constancy, quantum entanglement and tunnelling among other phenomena.

Before we get into this, however, let it be known that we are not the first to recognize that there is a "NOW" status in our midst. To my knowledge, the first mention of a "NOW" state was made by physicist and experimental psychologist Peter Russell who recognized in his 2001 book that - - "light seems to exist in a realm where there is no before and no after, there is only NOW" [4]. Additionally, the subject of NOW was fully discussed in a book by Richard Muller [5]. However, in neither of these citations was the concept of the "NOW-state" described as being the calculus derivative of "real" time. Therefore, our interpretation here of the NOW-State is most likely breaking new ground. Finally, the rest of this paper will be devoted to discussing additional insights as to where else the "NOW–State" fits into physics and personal settings.

2. Discussion of NOW-Space in Physics

Let us first point out that our described NOW–Space concept is no way like the 'ether' concept of old. The 'ether-layer' was considered a medium surrounding the Earth which was believed to be the carrier of electromagnetic (light) waves. This 'ether' was presumed to exist in the all-encompassing y, y, z, dimensions of space. The 'ether' concept was of course debunked by Michaelson and Morley in the late 19th century. They found to their amazement that the speed of light was constant and independent of the motion of the observer. From this, let us proceed to examine light's existence in x-y-z space in the context of our proposed NOW-Space. Let's also review some other "classic" physics phenomena in the context of the NOW-State concept.

(A) Speed of Light Constancy

It is basic knowledge that the speed of light is a universal, unambiguous constant and is independent of the relative motion of the observer. No matter how fast the observer is travelling in space, to this traveler, the speed of light measures the same; about 3 x 10^8 meters/second. Let's now consider a light wave propagating in our proposed *NOW* (instantaneous) state of existence as proposed by Russell [4]. Here, an outside observer, measuring the light wave's speed, would be measuring it with a standard measurement-feedback response system. Physics tells us that light waves will always follow the equation, $c = \upsilon \times \lambda$, where, c, is the speed of light and υ and λ are the waves' frequency and wave length.

As we propose that light itself is confined in *NOW*-Space, as the relative velocity of the observer and light source change, the light's frequency and wave length will change in proportion such that "c" remains constant. This phenomenon is demonstrated in the observed red or blue shifting of starlight as it accelerates away or toward observers on Earth. Light residing in this *NOW* condition will measure to have unchanging velocity properties but the 'color' of the light wave will change'. This measurement can be considered analogous to an outside observer viewing an operating movie camera picture-screen.

Whether the observer is stationary or moving (and observing the picture screen), the frames per second of the movie projector is mechanically fixed, it never changes. This metaphor should serve to explain how it is when a moving observer measures the speed of light, with the light existing in this *NOW-space*, the speed of light (metaphorically, the movie screen's frames per second) remains constant.

(B) Light's Duel Nature

Let's propose that light travelling through space in this *NOW*-Space always exists in the form of a wave. However, when the light waves strike a solid object, it instantaneously collapses into a small tight bundle of energy (photons) that are capable of physically interacting with the atoms in the solid media onto which it strikes. That is, the light wave instantaneously changes into a particle. This is what we know as the 'photoelectric effect'. Couldn't we then interpret that when light waves travel through NOW-Space and strikes a solid object, the light wave immediately transitions into a photon in x-y-z space? We have thus concluded that in NOW-Space, light behaves as a wave and in x-y-z space it behaves as a particle.

(C) Quantum Entanglement

In particle physics there exists a phenomenon known as quantum entanglement. The strangest thing about entangled particles is that if photons or other small particles such as electrons and small molecules are quantumly "entangled", they are able to interact with each other, instantaneously, no matter how physically far apart the "entangled pair" are from each other. This can also be referred to as non-local particle behavior. For example, if a pair of entangled photons are created and thrust into space, as you measure (physically observe) the spin of one of

the photons to be +1/2, the other photon immediately takes on a -1/2 spin; or vice versa. This process occurs instantaneously, even if the entangled particles are separated by light-years of distance.

Important too is that spin properties of the described photons are only assigned to the particular photon when one particle is physically observed. Before observing the entangled pair are said to be in a *superposition* state of existence. According to the "Copenhagen Principle" of quantum mechanics, a quantum system can exist in all possible states simultaneously. This phenomenon is called *superposition* [6]. However, when a quantum system is observed or measured, it is forced to choose a state which is the one observed.

In the quantum system of entangled photons, before they are observed, the photons are "paired together as one" even though they may be separated by a distance. In the 1930's, this led Einstein to refer to entanglement as being "spooky" action at a distance. At the time, Einstein had a serious disbelief of this phenomena. Behind his dubious acceptance of the "entanglement effect" was the fact that when observed, communication between the two entangled photons seemed to occur faster than the speed of light. To Einstein, all of this was unacceptable.

Quantum entanglement is indeed a strange,magical effect, but in the particle physics world, it has been proven to be a real effect many times over [7][8][9]. The special, strange feature of entanglement's counterintuitive-ness is based on its nonlocality; two entangled particles can physically affect each other without any touching. By the way, this feature of nonlocality is what separates the field of classical physics (where locality reins) from quantum physics (where nonlocality reins). We have already said that light exists in NOW-Space and therefore explains light speed's constancy. Continuing, might this NOW-Space concept be able to explain the instantaneous/collective/physical communication between space-separated quantumly entangled particles?

We have previously explained the NOW-State as having dimensions of a functional activity event, N, per increment of time; where time is an infinitesimally small segment and space equals infinity. Can we then say that this NOW-State of instantaneously also means everywhere-at-once? We have mentioned earlier that two quantumly entangled particles exist as an intimately coupled "pair" and can function as one "system" even if they are a far distance apart from each other. From this, can't we therefore conclude that entangled particles must also reside in our proposed NOW-State? Could it then be that by definition, our NOW-State itself represents a nonlocalized state of existence?

(D) Physical Phenomena that Occur Faster than Light Velocities

Throughout the field of physics there are examples of earthly physical events that defy Einstein's 'nothing can travel faster than the speed of light' rule [10]. We have already discussed the nonlocality of entangled particles. However, in addition to entanglement, there are other physical phenomena that are found to occur at speeds faster than the speed of light: (1) quantum level electron-jumps within atoms and (2) quantum (electron) tunneling. Might these phenomena also function in this "NOW-State"?

Within an atom, when electrons jump from one quantum energy level to another, resulting in an atom's unique atomic spectra, these electron jumps are said to occur instantaneously. Specifically, travel time of an electron jumping between one quantum level to another, equals to zero. Could it be then that within all individual atomic entities, the single atom-system (electrons, neutrons and protons) itself exists in the NOW (derivative of time) state? Somewhat in support of this, it has been stated that the single electron and the single proton in a hydrogen atom are entangled [11]. Perhaps then, could one say that the electrons and protons within all atoms are entangled? Therefore, all the electrons, neutrons and protons in all atoms can function as though their electronic systems exist in an entangled and therefore a NOW-state?

This could be true but somehow, atoms or molecules entering into a chemical reaction must be different. Could chemical reactions be considered as manifestations of atoms or molecules collectively interacting in definable x-y-z space? Could it be that during chemical reactions, the reacting electrons and protons transform from the NOW-State into the x-y-z state only to return to the NOW state when the reaction is completed? Chemical reactions, of course, follow their own kinetic behavior related to the rate of the collisions between two or more atoms or molecules; proceeding like in the kinetic theory of gases model for particle collision dynamics. On this, be reminded too that chemical rates of reaction are temperature dependent; kinetic theory is at work. Let's conclude that all chemical kinetic reactions occur in x,y,z, (real-time) space and follow real time collision kinetics.

Once the reaction is complete, the electrons and protons revert back to their original internally entangled within atoms, NOW-State of existence. New chemical structures are formed in these reactions but the atomic electrons, protons and neutrons in this new structure all reverting back to the NOW-State, but now in a new configuration.

Another example of physical phenomena that defies Einstein's light speed rule, relates to quantum tunneling. Here, it is known that solid-state conduction electrons can pass through a mass of solid material unimpeded. This event, known as quantum tunneling, is prominently found in the field of solid-state electronics. For example, an AC current can be rectified (converted to DC) by passing the AC voltage through a solid (semi-conductor) material rectifier. It is found that these tunneling electrons pass through a semi-conducting solid faster than the speed of light [12]. Mechanistically, though, when a current of electrons passes through a semi-conducting solid, some of the electrons are reflected back and the others pass through or "tunnel" through the solid material unimpeded.

It is thus conjectured that, assuming all the atoms in the solid can be considered to exist as singular systems residing in this *NOW* state, these "tunnelling" electrons can somehow instantaneously connect through each individual atom in the constitutive solid unimpeded. Somehow, the tunnelling electrons are connected to each other and can jump between atoms in such a way as to be completely unhindered. Could the tunnelling electron be said to exist in NOW-Space during its traverse through a semi-conducting solid? Could the conduction mechanism be like electrons jumping from one (atomic spectra) energy level to another at faster than light speeds? All these faster than the speed of light phenomena just discussed seem to fit together. Also, can we thus conclude that all of these faster than light electrons in all materials function as though they are entangled and therefore function as though they were in our proposed NOW state?

(E) NOW-Space and Gravity

Classical physics tells us that all masses in the Universe exert a gravitational pull between each other according to the classical Newton equation, $F_{12} = G(m_1)(m_2)/r^2$ where F_{12} is the gravitational force between two masses, m_1 and m_2, separated by r, the distance between them. Here, G is the universal gravity constant (a measure of the earth's gravity continuous pull force). Note that there are no distance limits to the force of gravity; gravity forces reach out to infinity. Of course, the further away you are from the mass, the weaker the force - - -down to zero at infinite distance. This tells us that the most important parameter in Newton's gravity equation is mass.

There are many massive celestial bodies that comprise the Universe. It's the attractive force of gravity of these celestial masses that hold all these celestial bodies so positioned in space that the geometric structure of all our universe remains dynamically moving but stable. Therefore, in practice, the whole Universe is connected together by gravity force fields. They act like a continuous 3-D web that surrounds our very being and material existence. All material things of the Universe are imbedded in and influenced by this integrally-attracting gravity field. It's no wonder that gravity has been described as being a "nonlocalized" force with nonlocal properties just like entangled particles [11].

We have already mentioned that light can be said to exist in this *NOW* instantaneous "state". From this, can't one then conclude that gravity, like light, exist as a continuous, ubiquitous force field NOW-State? With gravity, so long as we are in the proximity of any mass-object, it is easy to say that gravity is everywhere in our physical Universe. Can it then be said that gravity, like light, exists in a realm where there is no before and no after - - can we therefore conclude that gravity itself also exists in the NOW-State?

While we have examined the overall status of gravity forces in the Universe, how do "gravity waves" fit into the picture? Gravity waves are created by collisions between cosmos-residing, gravitational masses? While gravity waves have long been precited by Einstein, experimental proof of their existence has only recently been confirmed. California Institute of Technology's

Rip Thorne was awarded the 2017 Nobel Prize in Physics for experimentally confirming that gravity waves exist [13][14].

While it is our supposition that gravity wave collisions occur in NOW-Space, it has been determined that gravity waves travel through x-y-z space at the speed of light. Can it then be concluded that once two cosmic masses collide in NOW-Space, the created gravity waves instantaneously move into x-y-z space? Therefore, might the speed of gravity waves in x-y-z space be like light and have a constant speed independent of the velocity of the observer? I doubt if the answer to this question is just around the corner because the study of gravity waves is an experimentally very complex and cumbersome field of study.

Summarizing, gravity waves are basically the "impact-concussion noises" that are created when two galactic masses collide. These disturbances then proceed through x-y-z space in the form of a wave at the speed of light. If we consider the gravity fields of the galactic masses as residing in the NOW-State and the gravity wave propagating through x-y-z space after the moment of collision, it must be that cosmic collision creates a situation resembling what happens when light waves strike a solid mass.

Here we said that the electromagnetic waves are immediately changed from a wave form to photons (particles). Making the analogy then, when two galactic masses in "NOW-Space" collide, the kinetic energy of collision converts to a wave form, a gravity wave. This formed "gravity wave" then leaves its *NOW* space and instantaneously enters x-y-z space. This gravity wave is thus relegated to travel through x-y-z space at the at the speed of light. Concluding, then, when light waves strike a solid object, they transform into a particle (photon). With gravity the reverse happens, when gravitational (particle mass) impacts occur, the gravity particle transmutes to a wave form.

3. NOW–Space and Society

Let's ask the question - - can societal consciousness be considered to exists in the NOW "dimension"? Arguments can be made in support of this. In this paper we have gone far beyond what Russell mentioned in his book about NOW and its status relative to light [4]. Let's now delve into some explanatory arguments and other ramifications that support the "Instantaneity-Space" concept with regard to human conscious and non-conscious function.

Societal Consciousness: We have already mentioned that human consciousness can be described as functioning as a continuous stream of "NOW" instances in time. Therefore, by definition, can we therefore conclude that the state of human consciousness always resides in this NOW-State? This seems logical since of all of our human mental operations, thinking, day-dreaming and all thought processes do not involve any physical movement of mass objects. On this, you may ask, what about the movement of brain neurons? It is said that during the thinking processes, neurons move across various parts of the brain much like electrical signals move in a

computer. On this we can assume here that brain neurons are massless. Human thinking involves a blend of stored historical information, experience, present mood, outside environment and other factors that define consciousness. Thinking is always the precursor to human action and always involves the revival of the brain's stored knowledge before any decision or implementation signal is decided upon. It is believed that this neural action is instantaneous. This also means that mental decisions are made by the functioning brain's instantaneously connected neural system. The various parts of the brain could be said to be "entangled" in such a way that decisions are made with the neuron system acting as a single system 'grouping'. Therefore, our thought process could be said to exist in the realm of a NOW-State.

Let us now expand and clarify what we mean by the thinking process. First, let's consider "thinking action" as being the precursor to any implementable decision. This thinking occurs in an "instantaneous state", no physical action involved. Be reminded too that it's only the thought, plan and wish events that "swish" around in your brain that are in the NOW-State. The implementation act, however, starts by a brain signal. Brain-thought to implementation processes are not instantaneous. Physiologists have experimentally found that in brain signal/thought to physical (e.g. finger movement) have a finite human "reaction-time". For example, brain-thought stimulus to physical implementation times for professional Formula 1 race car drivers have been measured to have about a 200 milliseconds (duration) reaction-time. This includes the average time it takes for the brain to perceive, identify, decided on the response and initiate a motor command, thus proving that these action processes are not instantaneous [15]. From this, let us conclude that it is only in the thought-initiation-perception stage of the human conscious function that resides in our proposed instantaneous NOW-State.

3. Concluding Remarks

It is customary for all physical things to have definable and measurable dimensions with units like space: length in meters for size and for time: hours, minutes, seconds. With this in mind, might it be possible to assign dimensional units for our proposed *NOW*-Space? Can the state of "instantaneity" have dimensions? We have already defined NOW-Space as the calculus derivative of real time. From this, can we conclude that the dimensions of NOW-space be logically defined as event, N, per time or dN/dt, where N represents the physical process (or event) being carried out and, dt, the infinitesimally small increment of time? From this, then, couldn't the dimensions of NOW-Space be stated as "functional action" N, per time; albeit infinitesimal time? This being said, it seems like we can safely conclude that NOW-Space is not a new "dimension" but it is a variant of our existing time dimension; "instantaneous event" per time.

This document has introduced the concept of NOW-Space that has been defined in units of time we have referred to as "instantaneity". We have raised the issue that light and gravity reside and function in this single-unit cosmological entity we can call **Cosmic** NOW-space. Similarly, we

have identified one other form of NOW-Space: **Personal** NOW-Space where our human consciousness resides.

Having introduced NOW-Space, could we possibly consider it to be our long sought-after "fifth dimension"? We have shown that this *NOW* concept seems to easily explain (a) light's speed constancy, (b) the instantaneity of quantum entanglement processes, (c) the instantaneity of electron quantum jumps in atoms, (d) the instantaneity of the wave action of light changing from wave to corpuscular (photon) particle action, (e) the phenomenon of quantum tunnelling and (f) it could possibly be the media in which the Universe's gravity's force field resides.

A most important development here is that we have defined NOW-Space as the (calculus) derivative of real "Earth-time". So, it's metrication parameter can be stated as NOW-action-event per time where NOW represents a particular physical event and "time" is an incremental instant (practically zero). Can we then consider the term **Event/micro-increment of Time** a new dimension? Let's fully recognize that introducing the new "dimensional" entity of NOW-Space into physics jargon is a forward step. Due to its importance, let's give it all another look. Earlier, we mentioned that Kaluza and Klein sought to establish a fifth dimension in terms of some hidden x-y-z variable while studying Einstein's relativity theory. Later on, String Theory has added more x-y-z dimensions in the search for a theory of everything.

We have here approached the new dimension search by introducing a new twist on our present time dimension. We called it "instantaneity" (the differential of (integral) Earth time). Therefore, can we conclude that our NOW-event/Time definition be considered in the same realm as the Kaluza/Klein "hidden" dimension and the extra dimensions called for in string theory? We have already said that the Kaluza/Klein "hidden" dimension is a variant of x,y,z space and is not a new dimension per se. From this, we can therefore conclude that the NOW-Space "dimension" is basically a variation of time - - - it's the derivative of time - - and not a truly "new" dimension.

While this paper has introduced and allowed us to speculate on some properties and characteristics of what we called NOW-Space, many questions remain to be further clarified:

(1) Unitarily, does NOW-Space encompass the complete Universe; is it a universal property? Alternatively, is it merely another human construct property of the Universe?
(2) Dose NOW-Space expand at the same rate as the Universe - - at an accelerating expanding rate? Is it dynamic?
(3) Do light (with its massless energy feature) and gravity exist solely in this NOW-Space world? Is there any information out there that could be added to support these claims?
(4) Do entangled quantum particles reside in NOW Space?
(5) Do electrons, neutrons and protons in all elemental atoms reside in an entangled state like how the electron and proton exist in the hydrogen atom?
(6) How do cosmological singularities (black holes) fit into NOW-Space?

The above presents a list of the many questions we can pose about our NOW-Space concept. I thus challenge you the reader to ponder these questions and come to your own conclusions.

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