



Review Article

The Quantum Theory of Entanglement and Alzheimer's

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Abstract

A unifiable quantum theory of gravity should link to information and include biology as well as entanglement. There are many quantum theories of gravity linked to Einstein's theory of general relativity. We link to Newtonian gravity to show new horizons of information, entanglement, coherence, synchrony, consciousness, Alzheimer's, strong coupling, dark matter, geological experiences, Brownian motion, and more in our referred papers. A particle has been observed to exist at more than one place at the same time. We remember Stephen Hawking's view in our words that the characteristic of a true theory is that it looks true from different angles, we say, like the roundness of the earth. The world wants to focus her attempts to cure the horrible decease of Alzheimer's, while its cause is unknown. Understanding the cause may help to find the cure. The important horizons are consequences of our quantum theory of gravity. We cannot help referring to it. So we do.

Keywords: Non-locality; Alzheimer's; Consciousness; Quantum gravity; Entanglement

Introduction

The reasons how gravity links to strong force, why it is weak, is probabilistic, incorporates information, explains dark matter when quantized, relates to consciousness, connects to the ancient views, and entangles, leading to coherence in the brain are progressively documented in our open access articles [1-8] with related background information. Here, we support our probabilistic (quantum) theory of gravity, with the views of recognized dignitaries, provide some hysterical perspectives and respond to the issue in a popular journal about the lack of mathematics to support an observation that Nature sends information about a forthcoming earthquake to the sky [9], that we cannot pick up ahead of its occurrence. We add our view on the potential cause of Alzheimer's.

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Entanglement

Quantum entanglement is defined as a physical phenomenon in which the measurement done on one elementary particle will instantaneously affect the state of another elementary particle located far away unrestricted by the speed of light limitation in Einstein's theory of special relativity. In reality, we say, there are not only two particles, but multiple particles that can show the phenomenon of entanglement. According to our quantum theory of gravity, one particle can interact with two or more (multiple) particles instantaneously on a probabilistic basis. Last year we published our view about "The Quantum Theory of Entanglement and Brain Physics"[8]. There, we used the phrase, "multiple particles can reciprocate", which involves the author's concept of the reality of Nature relating to elementary particles. The reciprocation in our concept is instantaneous leading to the fundamental cause of entanglement. The multiple particles, we implied in [5] on dark matter, are separate space times. Having said that, we are delighted to meet legendary figure, Feynman's 1957 view about superposition (entanglement), marvelously dug out and brought forth to all of us by Tim Folger of Scientific American [10].

Feynman's View

"Feynman argued that if gravity is indeed a quantum phenomenon, a superposition of a particle in two places at once would create two separate gravitational fields in case of a small mass in a quantum superposition, two different spacetimes would coexist side by side, almost like two separate universes, a state of affairs that should not exist in Einstein's theory [10]". Our article on dark matter in [5] implies that each quantum particle is entangled with multiple quantum particles in the universe and they all create their own gravitational forces. The entangled particles are the superposition. Feynman argued that only quantum phenomena can be entangled [10]. Therefore we meet Feynman's argument. We explained why we quantize Newtonian gravity in [8].

Elaboration

Since "The Inverse Square" is a common denominator of our quantum theory of gravity and that of the Newtonian gravity at short scales, we say our inverse square makes the classical one come out that way in addition to its ability to show entanglement on a logistical basis, and derive strong coupling to supplement our older derivations in [1-3]. Newton was in doubt about the duplicate reciprocal (inverse square law) [3]. We respond to Newton's doubt on his inverse square law by setting his inverse square on a quantum mechanical Planck scale, probabilistic basis, generating an equivalent of a homogenized mixture of the two non-unifying (quantum and classical) theories. Newton could not have known quantum reality, dark matter, entanglement and ever increasing knowledge of quantum weirdness.

A negative (dislikable) point is that ours has a very weird implication that each particle must be like a centipede with invisible legs and multiple existences of its particle like legs-tips and that the centipede extends the legs all over the universe instantly to interact with

other particles as if she uses the legs for a swing dance with other particles. We stick with the positive aspect of that dislikable point since it yields the overdue explanation of entanglement which must play its part also in the brain. Without Einstein's help, Heisenberg's paper on uncertainty could not be published. We can see the reason why: In a simplified illustration it leads to a weird conclusion that the elementary particles are behaving like worms.

Our theory of quantum gravity claims that gravity is the cumulative effect of the long range manifestations of the constants of Nature playing their part to create the coherence in the brain [8]. The explanation extends to synchronicity. Since the difference between synchronicity and coherence is that of scale per book [11] p 220. The book adds "If dark matter and dark energy have genuine physical properties, associated dark information must also exist [11] p 323. "True, it does exist per the subsection "Information Paradox" of [5] on dark matter".

While talking about two nodes in the brain, Dr. Nunez writes in his (2016) book [11] p 215: "...the label "functionally connected" assumes nothing about the cause or causes of this statistical relationship." We have now provided the cause of a statistical relationship implicitly and briefly in 2018 [8] in subsection "Global Information". The statistical relationship is analogous to the numerical language of Nature in our article [6].

The ON and OFF particle interactions every Planck time are like the binary system of information per our quantum theory of gravity; they imply that the universe speaks in integer numbers of Planck units. The weirdness of quantum mechanics to a common man is why not half a Planck unit? Explanation of money no less than a penny, makes the questioner swallow the answer.

Geology and Information

10/2018 Issue of Scientific American article [9] shows lack of a physical basis for the earth quake information reaching the sky prior to the earth quake. Here, we try to substantiate our abstract [12] about the subject information. The drastic relative movements of (1) the high order of magnitude of the particles in huge subcontinent sized tectonic plates, below the surface of the earth prior to the earthquake would change their individual distances from (2) the air particles floating above the earth, creating the changes in the ON and OFF interactions between (1) and (2) per our quantum theory of gravity, resulting in the drastic redistribution of the forces, expressible in Planck scale, of the constants of Nature in the air that birds must be capable of sensing and translating the implicit information into the possibility of a forth coming disaster. Entanglement of particles would create their own gravity effects, consistent with Feynman's View above. If technology can pick up the subject anomaly, it may be able to forecast earthquakes.

We realize it is a big "IF", since the forces from the constants of Nature like the strong coupling become so diluted that they become practically indistinguishable at short distances of 1000 fm (about the radius of an atom). Our visualization of the dilution effect, linking strong force to weak gravity was at the base of our question to Dr. Weinberg in the following paragraph.

Consciousness/Alzheimer's

Nobel Laureate Dr. Weinberg has an interesting chapter in his book

titled, "The Trouble with Quantum Mechanics" [13], citing Nobel Laureate Eugene Wagner's view that it was impossible to formulate the laws of quantum mechanics consistently without referring to the consciousness. We implicitly put consciousness on a scientific basis with our "principle of reciprocity" in the phrase: "multiple particles can reciprocate" in [8]. We welcomed Wagner's view, since it gave us a platform to stand on before writing the book [14], prepared primarily for a hand out at our 2011 oral presentation in Stockholm for a conference on consciousness. Here, we again thank Dr. Weinberg with due respect for a humorously encouraging, well received by thousands, and congratulating answer to our question related to our crave for unifying strong coupling with gravitation, at the APS Centennial Meeting, Atlanta, Georgia in March 1999. Our key point, now, in [8] is that gravity is fundamentally linked to nature's information system enhancing coherence in the brain and synchrony noticed elsewhere. We cannot rule out the possibility that Einstein and Satyendra Bose of India got the idea of bosons (which led to the discovery of Higgs Boson, the God particle) at the same instant. Entanglement must exist everywhere in the universe; we see no reason why the brain should be an exception. Amyloid Plaques and tau tangles are considered the cause of Alzheimer's [15]. If so, the search for the cure of Alzheimer's may reduce to finding an answer to the question: "how to nullify the information created by such proteins and plaques".

According to our quantum theory of gravity, one particle can interact with multiple particles in the universe instantaneously across the universe on a probabilistic basis. The probabilities of interaction of two particles, D1 and D2, non-zero, Planck Length distances apart, are squares of $1/D1$ and $1/D2$, such that, the combined probability would be the square of $1/(D1 \times D2)$, which would be man's version of probabilistic mathematics in general, devoid of consciousness. If we combine the result with what quantum theory lacks per the view of Eugene Wagner, we have to think of the conscious mind of the particle involved. If the interacting particles stay engaged, the low probability event in general would become a longer term realistic event called entanglement, consistent with the implicit principle of reciprocity in [8]. The implicit body mind link at quantum scale, we say, manifests to 7/2019 issue of the Scientific American [16] high-lighted upfront as "How the Mind Arises-Network interactions in the brain create thought". The particle interactions must create gravity waves per equation 1 of [5], if not we would not have gravity. According to our quantum theory of gravity, the particle interactions are ON and OFF every Planck time and they would generate gravity waves with information, consistent with our information paradox in [8], making it needless to resort to the controversy of the conventional black hole information paradox in physics.

The disruption created by the age related plaques and protein deposits (structural changes) would add noise to the otherwise normal distribution of information in the orchestral music inside the brain, supplemented by age related vascular changes analogous to the structural changes. Since the probability of interaction in our quantum theory of gravity goes down with increasing separation of particles, the closer modules are liable to be more communicative, unless the consciousness aspect intervenes drastically in the network of brain communications. Some physicists including late Nobel Laureate John Bell believed that entanglement violates the spirit of the relativity theory [17]. Just because experimentalists observed two (or three) particles entangled at any one instant, the theorists cannot preclude the

possibility that multiple particles, say 20 out of $10E80$ particles in the universe, can be entangled at an instant per the spirit of our theory, accounting for the dark matter in [5]. Since these 20 entangled particles belong to one system, there should not be even apparent violation of the uncertainty principle, as EPR had suggested according to the argument of Dr. Yanhua Shih in [17].

The reputed journal Nature did not test the brain of slaughtered pigs for consciousness [18]. Their amazing job succeeding to maintain the brain structure resulted in maintaining the brain's vitality. The probabilistic nature of our quantum gravity and related information exchanges as a function of the separations between particles must maintain the vitality so long as the brain structure is maintained as it did. The cat's implicit prediction of the forth coming demise of a nursing home resident as practiced in America is obviously not based on the cat looking at the brains of the residents, requiring a multidisciplinary study of probabilistic realities such as this.

We are delighted to see the pre-thinking of Feynman expressed in his famous quote about the mystical number (137) interpreted as potentially related to some natural logarithm matching our derivation of 137 in [4]. Regardless, we say that our derivation is not just a coincidence; it supports spin based information of the universe. The natural logarithm of probabilities we used there is not only entropy per Boltzmann, but also information per Shannon, the Guru of information theory. The number 137 is about electron/photon interaction called fine structure constant involved in the generation of energy from food we eat. We feel it is somewhat noteworthy that age related structural changes in the brain could adversely affect the locations where electron interactions play their part if it impacts Alzheimer's.

Meeting of Minds

Considering age reflects wisdom, we look at later views of Einstein. Regarding his EPR argument against the completeness of quantum theory, Einstein confessed to Schrodinger that the paper was written by Podolsky. It did not come out in the end so well [19]. Einstein was, in his final years, a realist, not a determinist [20]. We cannot answer questions about the fundamental cause of thought, anger etc. reminding us of popular books like [21,22] and Scientific American article [16].

Conclusion

An elementary particle has multiple existences each interacting with multiple existences of other elementary particles creating entanglement in the universe and coherence in the brain. The quantum theory is incomplete. A true quantum theory of gravity must show how it can fill the gap and show overall unification. We show ours as most promising.

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