

On Dark Chemistry

What’s Dark Matter and How Mind Influences Brain Through Proactive Spin

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Abstract

“Dark chemistry” is a hypothetical chemistry based on the hypothetical axion dark matter. Benjamin is commendable for boldly going where no one has gone before but may find himself still in the “bright” territory instead of the “dark” side, if he is willing to use Occam’s razor to cut out “dark” things and replace them with non-local effects. Based on our recent experimental findings, our contentions are two-fold: (1) dark matter is likely the cosmological manifestation of quantum entanglement; and (2) the hypothetical axion dark matter is, therefore, replaceable by non-local effects mediated by the primordial spin processes. We also discuss the cause of apparent dark energy. In particular, we explore the issue how mind influences the brain through said spin processes. Our thoughts are that the manifestation of free will is intrinsically associated with the nuclear and/or electron spin processes inside the varying high electric voltage environment of the neural membranes and proteins which likely enable the said spin processes to be “proactive,” that is, being able to utilize non-local energy (potential) and quantum information to influence brain activities through spin chemistry and possibly other chemical/physical processes in defiance of the second law of thermodynamics.

Key Words: dark matter, dark energy, axion, gravity, quantum entanglement, proactive spin, free will, consciousness

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1. An Initial Take on “Dark Chemistry” Model

The current issue of NeuroQuantology contains, as a perspective, an article entitled

“Dark Chemistry or Psychic Spin Pixel?” (Benjamin, 2007) which promotes a “dark chemistry” model of mind and discuss the spin mediated theory (Hu & Wu, 2002,

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2004a & 2004b) and the Hameroff-Penrose model (Hameroff & Penrose, 1996). One may recall that dark matter is a hypothetical matter of unknown composition whose presence is inferred from its gravitational effects on visible matter, dark energy is a hypothetical form of energy that permeates all of space and tends to increase the apparent rate of expansion of the universe, and axion is a hypothetical elementary particle postulated to resolve the lack of CP-violation in the physics of quarks and gluons (Source: Wikipedia). Axion is a candidate for dark matter. Benjamin's "dark chemistry" is a hypothetical chemistry based on the hypothetical axion dark matter. Benjamin claims that his model is necessary because "quantum parameters such as spin are universal, while discernible mental phenomena are not [so] a homunculus seems necessary to provide an adequate ontological substrate for mind, to avoid an integration of infinite regress" (Benjamin, 2007).

Benjamin is commendable for boldly going where no one has gone before. However, we are afraid that Benjamin, possibly a few other individuals, has misunderstood what is spin-mediated consciousness theory. Our theory is an ontological theory and, in its dualistic embodiment, a non-spatial and non-temporal pre-spacetime (nonlocal domain) is the homunculus (Hu & Wu, 2002, 2004a & 2004b). Our concept of spin, being the primordial self-referential process, is much more than a passive quantum parameter. It is the mind-pixel, the linchpin between mind and the brain and the ultimate stop-gap of infinite regress through self-reference in pre-spacetime; or, as Benjamin put it, spin is "psychic" (*id*). It is through the self-referential spin processes that a conscious being such as a human

perceives and interacts with the external/physical world. In other words, spin is a process capable being "proactive" in the brain. To justify such view, we would like to point out that in both Hestenes' geometric formulation of quantum mechanics (Hestenes, 1983) and Bohm's non-local hidden variable formulation (Esposito, 1999) it has been shown that spin is solely responsible for all the quantum effects. Further, although spin is universal, the reason why it allows the brain to have conscious experience and free will is because of the particular structures and dynamics of the brain as discussed elsewhere (Hu & Wu, 2002, 2004a & 2004b) and further below.

As we understand it, the gist of Benjamin's model is a homunculus or invisible axion body running along the visible physical body which interacts with said physical body through dark chemistry and serves as the host of the soul/spirit in order to avoid infinite regress. Further, according to Benjamin, the axion body is made of intransient non-electric particles and virtually a hologram integrating the patterns of information at various levels. Presumably (we guess), dark chemistry involves "the resonance between the dark and visible bodies of an organism" and "dynamic biophoton process of kindling and quenching the "potential" of the [holographic] pattern" (Benjamin, 2007).

We agree with Benjamin that "[m]ind and consciousness need not be mystical or magical" (Benjamin, 2007). However, his "dark chemistry" model is very convoluted because it involves all these hypothetical and/or exotic entities such as dark matter, dark particle, dark body, invisible axion, non-electric particle, homunculus, biophoton and graviton. Someone has already commented that "I think that having

learned how many new entities are put here into play to explain consciousness, William [of] Occam would turn in his tomb" (Patlavskiy, 2007).

In the following sections, we shall argue that Benjamin may find himself still in the "bright" territory instead of the "dark" side, if he is willing to do an exercise with Occam's razor, cutting out "dark" things and replacing them with non-local effects mediated by the "psychic" spin. Based on our recent experimental findings (Hu & Wu, 2006a-d; 2007a), our contentions are two-fold: (1) dark matter is likely the cosmological manifestation of quantum entanglement; and (2) Benjamin's hypothetical dark matter axion, therefore, is replaceable by non-local effects mediated by the primordial spin processes. We will also discuss the cause of dark energy and touch upon how universe operates without Big Bang and speculate what are Black Holes.

In particular, we shall explore the issue how mind influences the brain through the primordial self-referential spin processes which, we admit, have not addressed in detail previously. Our thoughts are that the manifestation of free will is intrinsically associated with the nuclear and/or electron spin processes inside the varying high electric voltage environment of the neural membranes and proteins which likely enable the said spin processes to be "proactive," that is, being able to utilize non-local energy (potential) and quantum information in pre-spacetime (nonlocal domain) to influence brain activities through spin chemistry and possibly other chemical/physical processes in defiance of the second law of thermodynamics.

2. The Origin of Dark Matter and Dark Energy

Before we go on, we would like to state that Einstein is no doubt one of the greatest minds ever lived. He made monumental contributions to physics from explaining photoelectrical effect and Brownian motion to constructing special theory of relativity, the famous formula $E=mc^2$ and Bose-Einstein Statistics. But just because Einstein is great does not mean that he was infallible as the case with EPR (Einstein et al, 1935) debate and his general theory of relativity ("GRE," see Einstein, 1915). We are all human and fallible. In any case, whatever happens, GRE is till an effective (approximate) theory for some parts of the universe such as our own solar system.

With this being said, it is likely, we contend, that Einstein's GRE is ontologically invalid because our experimental results indicate that gravity is nonlocal and instantaneous (Hu & Wu, 2006a-d; 2007a) as Newton reluctantly assumed (Newton, 1999 by Cohen et al) and Mach conjectured (Mach, 1960 by Open Court Pub. Co.) and a few other authors argued (e.g., Pope & Osborne, 1996). Besides, many experiments have shown that quantum entanglement is physically real (e.g., Aspect, 1982; Julsgaard et al, 2001) which implies that Einstein's theories of relativity are in real not imagined conflict with quantum theory. Until now, relativists have been able to hide behind the no-signaling "veil" because of the Eberhard Theorem (Eberhard, 1978). But that "veil" has been pierced and we must deal with reality. We understand that pointing out the real possibility that "the Emperor (Einstein) has no clothes" as far as GRE is concerned will irritate a great number of scientists in the mainstream, especially those on the superstring bandwagon, and may eventually destroy jobs, livelihood and research grants. But we need to ask ourselves the soul searching question: Are we here for truth

and the greater benefit of mankind or our self-interests and do we want to go down in history as conniving hypocrites or truth-seeking scientists? And so, as John F. Kennedy would urge, my fellow Scientists: ask not what mankind can do for you but what can you do for mankind.

We have proposed in a previous paper that: (1) gravity originates from the primordial spin processes in non-spatial and non-temporal pre-spacetime (nonlocal domain) and is the macroscopic manifestation of quantum entanglement; and (2) thus, gravity is nonlocal and instantaneous which implies that all matters in the universe are instantaneously interconnected and many anomalous effects in astronomy such as dark matter, dark matter, red shift and Pioneer effect may be resolved from this perspective (Hu & Wu, 2007b). Experimentally, we have found that the gravity of water in a detecting reservoir quantum-entangled with water in a remote reservoir can change when the latter was remotely manipulated such that, it is hereby predicted, the gravitational energy/potential is globally conserved (Hu & Wu, 2006a-d; 2007a). We have also found that the pH value and temperature of water in a detecting reservoir quantum-entangled with water in a remote reservoir changes when the latter is manipulated under the condition that the water in the detecting reservoir is able to exchange energy with its local environment (*id*). Thus, among other things we have realized non-local signaling using three different physical observables and experimentally demonstrated Newton's instantaneous gravity and Mach's instantaneous connection conjecture and the relationship between gravity and quantum entanglement. Our findings also imply that the properties of all matters can be affected non-locally through quantum

entanglement mediated processes. Second, the second law of thermodynamics may not hold when two quantum-entangled systems together with their respective local environments are considered as two isolated systems and one of them is manipulated. Third, gravity has a non-local aspect associated with quantum entanglement thus can be non-locally manipulated through quantum entanglement mediated processes (*id*). Therefore, our findings support a non-local cosmology (Hu & Wu, 2007b).

In light of these developments, we now ask the question what is the origin of dark matter and dark energy. To stray a bit, we further "naively" ask the question how universe operates if the Big Bang didn't happen. Since modern Big Bang theory and Black Holes are based on Einstein's GRE, there is a good chance that Big Bang didn't happen and apparent Black Holes are not actually Black Holes. There are many technical and general papers written in these areas too numerous to mention.

It is our current view that the universe is regenerative: It probably had no beginning and will have no ending, but is constantly and dynamically regenerated through cosmological processes associated with the primordial self-referential spin processes (Hu & Wu, 2003 & 2004b). These spin processes have two aspects: one aspect is expressive being associated with the concept of differentiation, negative entropy and David Bohm's unfolding (Bohm & Hiley, 1993); the other is regressive being associated with the concept of un-differentiation, entropy and David Bohm's enfolding (*id*). In our view dark matter is the cosmological manifestation of quantum entanglement associated with the regressive and un-differentiating aspect of the primordial self-referential spin process

(Hu & Wu, 2003 & 2004b) but seen as additional gravity caused by invisible matter under some cosmological conditions. In contrast, dark energy is the cosmological manifestation of reverse quantum entanglement associated with the expressive and differentiating aspect of the primordial self-referential spin process but seen as anti-gravity caused by negative pressure on the cosmological scale.

It is also our current view that entropy is really about regression and un-differentiation in which explicate and differentiated orders regress/un-differentiate (or become chaotic or random due to missing information, that is, our own ignorance due to complexity) through spin-mediated enfolding (quantum entanglement). On the other hand, it is our view that negative entropy is really about expression and differentiation in which hidden orders in pre-spacetime become explicate and differentiated under the right conditions through spin-mediated unfolding (reverse quantum entanglement) in which the second law of thermodynamics does not apply.

Besides the ever-evolving Life on earth, where can we find these expressions in a dynamic and regenerative universe? The famous but controversial Russian physicist N.A. Kozyrev suggested long time ago that stars, such as our own Sun, are machines generating energy through "active time" (e.g., Kozyrev, 2006 in PiP) instead of nucleosynthesis which would die out or not exist at all if the universe had no beginning. The energy researcher Harold Aspden has also for a long time advocated the view that the main source of the Sun's energy is not from nucleosynthesis but the age-old ether which fills the vacuum of space and could be converted into thermal radiation because of the particular composition and structure of

the Sun (e.g., Aspden, 2006). Well, one may not agree with the details of the Kozyrev or Aspden model, we suggest that the Sun may well be producing thermal radiations through spin-mediated expressive processes converting nonlocal energy (potential) in pre-spacetime into regular energy in spacetime.

Further, there is also the possibility that those apparent Black Holes are actually the centers of more violent regenerative cosmological processes in display. On the one hand, these structures violently express (unfold) nonlocal energy into visible matter with said expressive process being seen as dark energy. But, on the other hand, they also violently crush (enfold) visible matter into nonlocal energy with the patterns of said visible matter being seen as the symptom of a Black Hole and said regressive process being seen as dark matter. Of course, other authors probably have already expressed similar views from different angles or perspectives (See, e.g., Pope & Robinson, 2007).

3. A Second Take on "Dark Chemistry" Model with Occam's Razor

Occam's razor stands for the principle attributed to the 14th-century English logician William of Ockham which states that the explanation of any phenomenon should make as few assumptions as possible (Source: Wikipedia). Here, we will first cut out many of the hypothetical and exotic entities and concepts in the "dark chemistry" (Benjamin, 2007) model and replace them with known (or more reasonable, we think) entities and concepts. We will then see after this cuts whether the reconstructed model make more sense.

As an exercise with Occam's razor, we list in the following table entities and

concepts in the "dark chemistry" model and their replacements:

Benjamin	Replacements
dark	nonlocal
dark chemistry	nonlocal chemistry
dark matter/particle	nonlocal effect
dark/invisible body	nonlocal domain
axion/axion body	nonlocal domain
non-electric particle	nonlocal domain
homunculus	nonlocal domain
substance	"psychic" spin

After this exercise, the abstract to Benjamin's paper (2007) partially reads: "The search for universal laws of mental properties cannot be confined to neural correlates and chemical signals alone. Descriptions of subtle mental phenomena best fits characteristics of ["psychic" spin] which [produces quantum effect] categorized as [nonlocal effect]. Physical concepts that describe [ordinary] spin, chemical bonds, molecular configurations and cellular structures can be extended to [include nonlocal effect ([through] [nonlocal domain]), to yield an excellent physical model as a basis for the understanding of mental and psychic phenomena. [Nonlocal] chemistry [mediated by "psychic spin"] seems viable and natural."

This exercise also partially changes Benjamin's conclusion in his paper (*Id*) to: "A homunculus seems necessary to provide an adequate ontological substrate for mind, to avoid an integration of infinite regress. An invisible [nonlocal domain] in hypostatic indistinguishable union with the visible human body may be the locus of sentience/conscience. It supervenes and permeates [through "psychic spin"] an otherwise lifeless complex edifice of material structures made of ordinary fermions (electrons, protons and neutrons)."

4. How Mind Influences Brain through "Proactive" Spin

We will now explore how mind influences the brain, through the primordial self-referential spin processes (Hu & Wu, 2002, 2003 & 2004a&b), which, we admit, have not addressed in detail previously. All we have said was that the collective dynamics of nuclear and/or electron spin ensembles in neural membranes and protein is able to affect the neural activities of the brain through spin chemistry (*Id*). However, in order to purposefully influence brain neural activities so that a conscious being such as a human can interact with the external world and have free will, the said nuclear and/or electron spin ensembles have to be able to either self-organize to produce free-will-enabling emergent property which cannot be deduced from the spin properties or self-refer to their primordial origin, the non-spatial and non-temporal pre-spacetime (nonlocal domain) which in a dualistic embodiment hosts the mind and is the container of nonlocal energy (potential).

As we have discussed elsewhere, the brain is an electrically very active place where the electric field strengths inside the neural membranes and proteins during a typical action potential oscillates between -9 to +6 million volts per meter which are comparable to those causing electroporation of cell membranes and dielectric breakdown of many materials (Hu & Wu, 2004c and d). So, these electrical fields and their modulations through the action potentials significantly affect the conformations and orientations of neural membrane components such as phospholipids, cholesterols and proteins. Indeed, voltage-dependent ion channels perform their functions through electric

field induced conformation changes of the constituent proteins and studies on the effects of electric fields on lipids support the above conclusion (*Id*). We have shown that nuclear spin networks in neural membranes are modulated by action potentials through J-coupling, dipolar coupling and chemical shielding tensors and perturbed by microscopically strong and fluctuating internal magnetic fields produced largely by paramagnetic oxygen (*Id*). We have suggested that these spin networks could be involved in brain functions since said modulation inputs information carried by the neural spike trains into them, said perturbation activates various dynamics within them and the combination of the two likely produce stochastic resonance thus synchronizing said dynamics to the neural firings (*Id*).

Here we specifically propose the following: (1) the varying high electric voltages, being modulated by the action potentials inside the neural membranes and proteins, not only are able to input information into the nuclear and/or electron spin ensembles inside them but also are able to change the characters and properties of these spin ensembles and the pre-spacetime associated with them, making these spins to be "proactive;" and (2) the "proactive" spins so enabled allow the mind to utilize non-local energy (potential) and quantum information to influence brain activities through spin chemistry and possibly other chemical/physical processes in defiance of the second law of thermodynamics.

What plausible evidence do we have to support our above, some would say "outrageous," proposition? The answer is that we indeed do have some evidence supporting this proposition. First, our own recent experiments as discussed earlier and

elsewhere shows that nonlocal signaling and nonlocal effects mediated by quantum entanglement are physically real (Hu & Wu, 2006a-d; 2007a). Our results also imply that systems driven by quantum information such as our brain may defy second law of thermodynamics (*Id*). Second, the well-known placebo effect clearly indicates the influence of the mind over body.

Further, there are many experimental reports in parapsychology showing the possibility or at least plausibility of mind's influences over brain or matter. Of course, one always needs to be very careful about drawing conclusions and inferences from these reports. Just to mention a few, the PEAR Lab's results accumulated over the years shows that mind could alter, however small, random number sequences (e.g., Jahn & Dunn, 2005). William Tiller has reported that under a particular circumstance mind could influence the pH value of water in a remote location through an embedded device (e.g., Tiller, 2007). Danielle Graham and her group have recently reported anomalous gravitational and electromagnetic effects of certain trained persons during meditations (Graham, 2006). Indeed, Dean Radin has documented many related results in his most recent book and was able to repeat and verify some of these results through the studies of his own group (Radin, 2006).

In addition, in the areas of alternative energy, commonly labeled as the "back water" of energy research by the mainstream, there are numerous reports of excess heat being produced through electrophoreses and various plasma discharge schemes both in water and vacuum tubes (e.g., Graneau & Graneau, 1983; Correa & Correa, 2004). The common feature shared by these reports is that

somehow under the influence of electric fields or high electric voltages, excess heat was claimed to be produced from the vacuum or age-old ether. If some of these claims are true, we suggest that the source of the excess heat is the nonlocal energy (potential) in pre-spacetime (nonlocal domain) which under the particular arrangements in those experiments was converted into regular energy in spacetime such as thermal radiation.

5. Conclusion

In this paper we have responded to Benjamin's "dark chemistry" perspective. Benjamin is commendable for boldly going where no one has gone before. However, we have argued that his hypothetical dark matter axion is replaceable by non-local effects mediated by the primordial self-referential spin processes. Thus, he may find himself still in the "bright" territory instead of the "dark" side, if he is willing to use Occam's razor to cut out "dark" things and replace them with non-local effects. This argument is based on our recent experimental findings which suggest that dark matter is likely the cosmological manifestation of quantum entanglement. In

particular, we have explored the issue how mind influences the brain through the primordial self-referential spin processes. Our current thoughts are that the manifestation of free will is intrinsically associated with the nuclear and/or electron spin processes inside the varying high electric voltage environment of the neural membranes and proteins which likely enable the said spin processes to be "proactive," that is, being able to utilize non-local energy (potential) and quantum information to influence brain activities through spin chemistry and possibly other chemical/physical processes in defiance of the second law of thermodynamics. We have also discussed what dark energy is and touched upon the issues of Big Bang and Black Holes and made "naïve" speculations about them. If anyone gets offended by these thoughts, we sincerely apologize.

Finally, we cannot stress enough that "talk is cheap" and what really matter are what can be observed and measured experimentally. So our emphasis is still experimental studies and we have and will continue to "put our money where our mouth is" and let experimental observations and measurements to speak for themselves.

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