

Dark Matter and Dark Chemistry

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Abstract

Dark Chemistry is a discreet attempt to formulate for humans a plausible dark body parallel to the visible body. It is not an attempt to establish either the existence or origin of dark matter. Nothing new is added to the plethora of known and unknown particles or forces. Only, profusely available current data on axions and bonding mechanisms are used to explore this prospect.

Key Words: dark chemistry, dark matter, spin pixel, spin-mediated consciousness theory

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A Minimalist Method

A Minimalist Method Huping Hu and Maoxin Wu (2007) commend Benjamin (2003; 2007) for taking the study of consciousness to where no one has ever gone before, but lament that "dark chemistry" model involves too many hypothetical and/or exotic entities Is that germane? In this paper, I have tried to present (in proportionate lay lingo) the logic of an argument for Dark Chemistry in its essential terms, shaving it to its simplest provisos-axions.

Hu and Wu (2006; 2007) theorize that consciousness and its unity spontaneously arise from the joint quantum dynamics of the collapses of entangled quantum states of nuclear spin ensembles ("NSE")-the "protopsychic" spins or the "mind-pixels". They suggest that everything "dark" in Benjamin (2007) paper can be replaced with "non-local effects" mediated by spin, and present a two-fold disputation over Dark Chemistry. They contend that if dark matter is

the likely cosmological manifestation of quantum entanglement, then the axion dark matter is replaceable by non-local effects mediated by hypothetical primordial spin processes, else Dark Chemistry is convoluted. This is an if-then-else logical fallacy, trying to affirm the consequent of one's pick. The argument seems to be that proto-psychic primordial spin is an ontological sine qua non and axion being a product of its non local effects need not be considered as a separate entity. That is a red herring. A discreet intent of Dark Chemistry (Benjamin, 2007) was to seminally explore the possibility of perhaps spin mediated axion bonds similar to electron bonds, none any to establish the certainty or origin of axions.

Just as pre-spacetime, non-local effect, non-local chemistry, proactive spins, mind-pixel, self-referential spin, psychic spin, lynchpin, nuclear spin, electron spin, all refer to one entity "spins" (Hu and Wu, 2006; 2007), so also what Hu and Wu casuistically catalog as dark chemistry, dark particle, invisible body, non-electric particle, axion body, all refer to one entity "axions." Occam's Razor need not be sharpened here. Entities are not multiplied

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beyond the stated basic need of formulating an invisible parallel body.

Should an invisible body exist is a time honored question for all ages, including the 13th century Franciscan Monk and mathematician philosopher William of Occam. If Dark Matter offers a plausible answer, Dark Chemistry parallel to ordinary chemistry is a reasonable channel for that. That requires a minimum of three particles parallel to the three known ordinary particles in a visible body. The problem before a presumed Dark Chemistry is to conjecture some new exotic particles and parry Occam, or accept the copious data already available on dark matter. Charge-less (non-electric) axion particles are reported to be of wide range in mass (though of negligible order). Their existence is increasingly becoming indisputable on the grounds of string-theory, astrophysics, empirical data and tenable ongoing experiments. They are profusely discussed in multiplied publications too numerous to cite here. Thus Dark Chemistry as proposed by Benjamin (2007) is a minimalist approach for the necessity of exploring an uncharted realm, in full compliance with Occam: "Pluralitas non est ponenda sine necessitate" or "plurality should not be posited without necessity." Here the necessity was to "create" an invisible body that is a noumenal reality, not a nominal epiphenomeon.

Bonding and Interaction of Particles
Why do matter particles interact at all? It is still a fiddly question that beset science. The puzzle is that things interact without touching! At the macro level, there is action (gravity) at a distance, even galaxies apart, without contact. The sun attracts the earth and the other planets. Two magnets (substances with a certain precise alignments of electron configurations) attract or repel as if they "sense" each other's presence. All that is available here is substance. Calling these forces as "gravity" and "magnetism," is begging the question. Gravity does not vanish when mass turns to energy. In fact, gravitation does not depend directly on mass, it acts through the energy (and momentum) of the matter involved. If the matter changes in some way to reduce its rest mass, this would have no long range effect on the gravitational field, because there is no net change in energy of the gravitating matter. It is generally the total energy (rest energy plus kinetic energy etc.)

that is important for gravity, whether the particle in question has a rest mass or not. Gravity bends light rays (beams of photons). It acts on everything, including space itself! What causes it is simply unknown. Quantum gravity is yet another mystery. So is dark energy. Physics does not know what these forces are. It can only say that at the fundamental level, a force is a thing which is passed between two particles.

Winkler et al., (2006), report that atom pairs can also bind together even when the forces are repulsive, rather than attractive. This basically alters the molecular concept. Intuitively, a bound system of atoms implies an attractive force between them. However, to reach an equilibrium configuration, a repulsive force must balance the attraction. Otherwise the system would easily collapse. In the quantum world, attraction is not even needed to form a stable bound system. Repulsion can also effect a stable binding in the presence of a periodic spatial perturbation, where the energy cannot vary continuously, but is restricted to specific values. In order to conserve energy, repulsion between a pair of particles can lead to stable binding, if non-binding would lead the two isolated atoms to have energies not permissible (Fallani et al., 2006).

Substance reality in the ordinary material world is evidenced by a continuum of relational interactions. For this, chemical bonds are crucial in the formation of complex biomolecules and all entities beyond the atomic structure. At the micro level, protons are held together with enormously strong nuclear forces within the submicroscopic nucleus, though like charges must repel on contact. Indeed they do repel outside the nuclear potential well. At the atomic and molecular level, electrons are held together in pairs in their orbitals around the nucleus, though we expect them to strongly repel each other. Electric charges alone cannot account for chemical bonding, stable electron configurations (periodicity of elements) is also a key factor. Mendeleev's chemical periodicity of elements, a law of nature, is not defined by a simple numerical relationship, or nomological formulae. Chemists attribute stability of atoms and molecules to duet and octet electron configurations, extrapolated from the empirical stability of the noble gases. Generally, atoms with incomplete outer electron shells are reactive. They contribute or share electrons

between them to achieve the stable duet or octet configurations.

Quantum Mechanics is not in conflict with the chemical model of a molecule as a rigid structure of nuclei held together by shared electrons. The electron shells are only the quantum energy levels of electrons within each atom. The distribution of electrons within an energy level forms the electron clouds, or the atomic orbitals. An atomic orbital has a determined form and orientation, and can maximally contain two electrons, each in a different spin state, up or down. These two electron waves 'mix' in a way that yields the lowest energy. The atom itself strives for a totally saturated outer octet or duet shell, because this is a very stable state (inert Noble gas configurations). Quantum chemistry gives an almost full account of how atoms combine into molecules (and molecular ions). The theorem is only an approximation due to special quantum effects, particularly in excited states, for instance vibrational coupling that involves transitions between two structures. Energy states and electron configuration determine the way atoms can form bonds with each other resulting in molecular structures. In reality, it is spatial, temporal and spin relationships between electrons, each of which is unaware of itself and the relationships with each other. Dark matter also may have analogous spin affinities.

Under suitable external conditions, a molecular dynamic system consisting of two or more element-systems results in the creation of a fundamentally real and stable new unit of physicality, a new totality. For example, the dynamic natural law governing two atoms at certain energy levels can be explained by quantum chemical determination of the energy states of atoms and molecules. According to this law, every free system tends toward the highest order of stability by striving to reach the lowest possible energy state. If two negatively charged electrons from the visible matter can reach a configurationally stable combination in a philosophically sound atomic or molecular orbital, it is not beyond the realm of reason to postulate a similar atomic and molecular configuration for axions via spins and possibly gravitons or gravitinos.

Quantum numbers abound in atomic theory. They represent quantum possibilities of energy levels that emerge, and could be

applicable to the dark matter also. As in ordinary matter, dark-atoms will have the principal quantum number n , which can take the values 1, 2, 3, 4, 5, 6, ... n . Each n will have a principal energy level or a dark shell. Each shell will have n subshells. Each subshell has one or more orbitals within it; the s, p, d, f, g subshells have 1, 3, 5, 7, 9 orbitals respectively. The rules of placing axion-e within dark shells with nuclei made of axion-p and axion-n, may form the Dark Matter Aufbau principle and dark chemistries, yielding dark molecules, dark cells and dark bodies. Akin to the lighter ordinary atomic species, the lower Axion atoms, may have two main orbitals: the spherical orbitals or the s-orbital of the lowest energy levels (with the axion nucleus in the center), the dumbbell-shaped orbitals or p-orbitals of next higher energy levels (with the axion nucleus in the 'waist').

The rules of molecular structure, the directed valence bonds for each reactive atomic element, are natural laws governing conversion of simpler components into larger complexities. They could be applicable to axions also. The major difference is, while the wave-like properties of ordinary atoms or molecules can be ignored for most practical purposes, they are significant for axions, since they have relatively negligible masses.

Taxonomy, Dark Chemistry and Consciousness

On taxonomic grounds, Benjamin (2003; 2007) argues that in living matter three different axions exist parallel to electron, proton and neutron, respectively. Tentatively, they may be designated as axion-e, axion-p and axion-n. The electron/axion-e pairs occur in all taxa. Additionally, proton/axion-p pairs occur in animals. Adding to both are neutron/axion-n pairs occurring only in humans. The axion spin will have similar role as the fermion spin in the atomic and molecular structure of ordinary matter. Positive and negative gravitons or gravitinos in axions may play the role of negative and positive charges in ordinary atoms. Resonance and entanglement between the dark and light particles has a built-in recognition faculty for awareness and self-awareness, respectively.

Due to this differential inclusion of axions in each taxon, a complete dark structure that is parallel to the visible structure is absent in plants. Being less bound, the axion

interaction with the visible matter is the highest in plants. This could be the reason for the maximum biophoton emission in live cells of plants, according to references cited in Benjamin (2007). In animals, the stability of a dark body is increased by an order of at least 2, due to the added proton/axion-p pairs. This leads to lesser biophoton emission. In humans the stability of the dark parallel soma is the highest by an order of 3 at least, resulting from the triple binding of three different axions, leading to the highest intensity of biophoton emission. Presently available data on biophotons emission from the three taxa, which are rather qualitative, support this argument. Standardization and quantization of biophoton emission experiments with living cells are possible and needed.

In this scheme of ontic reality, three different but integrated factors become apparent in live humans: 1.A Light Soma (electric) 2.A parallel Dark Soma (non-electric) 3.A holistic Process (both dark and light). Unlike the light body, the dark soma is intransient being not fully subject to the laws of entropy. The Process consists of both light and dark components. When the dark soma decouples the light body, the light processes cease to exist, but the dark processes persist with the dark body.

No part of any living system is materially constant, except its structural form. The live cells are continually changing by growth, decay and replacement of its component fundamental particles. A steady state of flux is pervasive for the chemistry of these structures. Every 40 seconds the actin filaments in dendrites need replacing (Star et al., 2002). The NMDA receptors are replaced every five days (Shimizu et al., 2000). Activity level controls postsynaptic organization and signaling via the ubiquitin-proteasome system. The whole post-synaptic density (PSD) - the protein packed zone that powers synaptic activity - is regenerated, molecule by molecule, almost by the hour (Ehlers, 2003). Though Myelin and RNA molecules are known to last months, and DNA is fairly stable, they all undergo recurrent repairs and systematic substitution of old constituent particles with new.

The whole brain is recycled constantly, about every other month, synapses being the most active. Only their shapes are maintained.

Their component macro molecules disintegrate within minutes of their formation, as revealed by fluorescent tagging. They cannot maintain a steady identity. The new particles cannot carry the old information (memories), but systemic loss of memories or Kaleidoscopic personalities are not the norm. Evidently, the mind substrate must be different from any electromagnetic field associated with the molecules. This molecular chaos of ordinary living matter, raises the issue of unity, wholeness, and stability of consciousness and demands an extraordinary intransient substrate. A new kind of physical matter seems lurking in the dark with vague properties. What could be more appropriate than the extra ordinary dark matter as this mind stuff?

Mental states and material states will be both physical, if they are distinguished as extraordinary and ordinary material phenomena. The brain is then a many-particle system of neurons permeated by their axion counterparts, at an energy level which directly correlates with mental activity. Mental activity is co-produced by the visible brain and the invisible axion counterpart. It is more likely that the entire visible body, permeated by an invisible body of axions is involved in consciousness. Self-consciousness could be a product of mutually recognizing resonant structures. The restrictions of standard quantum mechanics are not relevant here, since the axion masses are negligibly small. If mental states are the primary objects of reference, the axion model shows explicatory features in a very subtle and refined manner.

The mental and material manifestations may inherit mutual correlations due to the fact that they are jointly caused by the visible body and the permeating invisible body, con-centering into a holistic hypostasis. There is the possibility of a direct causal interaction between mental and material domains. This scheme can explain the ubiquitous correlations between mental states and brain states, better than ordinary materialism.

Conclusion

Dark Chemistry could very well be the choice of the simplest that best fits the facts, among many theories from 'collapse', 'pilot wave', 'neural-correlates', 'back-action quanta', 'epi-phenomenon', 'explicate-implicate orders',

'psychic spin pixels' to 'many-worlds'. These are all as the heads of the fabled hydra, insolubly multi-faceted postulates, and at times tend to be just fairy tales for adults. As for William of Occam, his somatic luminous fermions are not all lost in the oozy meadow of insentient space-time, if they were ever entangled with chargeless axions which are not subject to entropy laws as ordinary matter is. Only his axion soma, having lost the energy of the visible body, may be at a very low (possibly negative) energy state, waiting to be energized from an external source, either for luminous manifestation or for reunion with the ex-entangled particle partners. This is also true for another William, Roger, the Baptist Minister and founder of Rhode Island State whose body with casket and all was eaten up by the roots of an apple tree! The inadvertent apple-cheeked "cannibals" never had to be concerned, as long as the axion theory of a dark soma is correct. Non-local spin effects by themselves have no such explanatory powers.

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