ON THE UNIFICATION OF THE FORCES

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PAPER 2 OF 4
AN OVERVIEW OF DIPOLAR COMPOSITES TO FORM THE BASIC STRUCTURE OF STABLE PARTICLES INCLUDING THE SCOPE OF THEIR INTERACTIONS WITH MAGNETIC FIELDS

ABSTRACT
This second part of a 4-part paper explores possible composite dipole structures. The correspondence between dipoles and known particles is partially resolved requiring, as it still does, a thorough measure of their size and velocity relationships, which is concluded in Paper 3. The concept of a standard magnetic moment is introduced as a measure of the time it takes for one zipon to spatially replace another in a magnetic field's spin. This measure is applied not only to the velocity of a field's spin rate but it is also used as a profound measure of distance, time and frequency. It concludes with a broad introduction to a proposed localized material source of stable particles from dipoles, extrapolated from the magnetic field itself. These dipole composites are proposed to transmute into photons, electrons, protons and neutrons, thereby generating increasingly complex elements.

SUMMARY OF THE SALIENT ARGUMENTS IN PAPER 1
Nebulae are proposed as a source of dipolar material. Probability would require the gradual field aggregation of this material. And this aggregation, in turn, would be the consequence of the immutable imperative that is proposed to compel the movement of each dipole into a condition of best charge balance in relation to other proximate dipoles. This culminates in the inevitable construction of stable strings that aggregate in line with M+6. It was argued that these closed strings form the bases of coherent magnetic field structures. In effect, truants from the nebula, would randomly transmute into zipons to structure stable, orderly, 1-, 2- and 3-dimensional fields comprising closed strings. And each string would have a localized orbit with a shared justification and a spin velocity in excess of light speed. These invisible fields could then operate independently of the universal torus and may yet be contained and hidden within the space of the nebula.

As mentioned these fields orbit with a shared and single justification, which in turn is associated with a charge value. Therefore, while each part of each field would express a single charge due to that justification, this charge would then be counterbalanced by an opposite charge at the mirror opposite position of that field on the other side of each orbit. Follows is a detailed description of a dipole and how it interacts with that field.

THE ARGUMENT
The positioning of particles in the elements is in line with the proposed interaction of their charges against an invisible 2-dimensional framework of magnetic fields that are structured from zipons. Their composite structures from dipoles form photons, electrons and protons. A distinction is drawn

between size and mass where the standard model determines mass in line with an object's weight inside a gravitational field. Here the composite size is the primary determinant. It is then argued that the particles' sizes and frequencies determine the rate of their interaction with 2-dimensional and 3-dimensional magnetic fields. All interactions between the particles and that field are confined to magnetic moments when there is a correspondence in the size of one or more of their composite dipoles with the zipons in the field, that size correspondence having been defined as a boundary constraint.

The immutable imperative would resolve the dipole's shape as a sphere as this would enable the required and perfectly balanced distribution of its charge. It is argued that the quantity of charge is fixed regardless of the dipole's size. Only its distribution would vary in accordance with its size, the bigger the dipole the thinner the spread and vice versa. In line with principles of correspondence, all dipoles would comprise equal values of two opposite charges localized near or on an inferred skin, or boundary. An imaginary equator would separate each charge, (Fig 6).

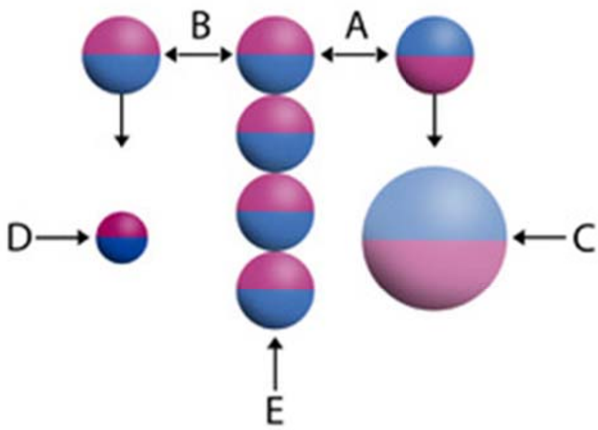

FIGURE 6
INTERACTION OF A SINGLE TRUANT WITH A MAGNETIC FIELD

- ***a)*** ***Truant that has transmuted to a zipon that is attracted to the field***
- ***b)*** ***Truant that has transmuted to a zipon that is repelled by the field***
- ***c)*** ***Transmutes back from a zipon into a truant***
- ***d)*** ***Transmutes from a zipon into a quark***
- ***e)*** ***String of zipons in a magnetic field***

So, while the quantity of charge of each dipole is proposed to be identical, the size of the dipole may be variable, having first been determined by the amount of energy transferred to that dipole when it first broke from a universal string to populate the nebula. Thereafter, further and subsequent random interactions with chaotic dipoles in the nebula would also transfer more or less energy all of which interactions and exchanges would result in variations to that dipolar size. This, in turn, would affect the distribution of its charge over a larger or smaller area depending on that size, while the quantity of that charge of each dipole would, nonetheless, remain invariable.

But, for any interaction between the field and that dipole to take place, there is first an implicit requirement for some correspondence in their sizes, which would also represent a correspondence in the concentration of their charge. The following analogy is used to partially explain this concept.

If a machine that is positioned inside a vacuum catapults stones with a constant force then the rule would be that the smaller the stone the further would be the distance thrown. Equally the bigger the stone the shorter would be the distance thrown. But beyond a certain size, or boundary constraint, there could be no interaction. Too small and the machine would not detect the stone. Too big and the machine would be unable to throw it. Alternatively it would be enveloped or crushed by that stone. In this way, all interactions are limited to a boundary constraint.

As argued the truant's size is variable but is determined by its velocity. The slower it is the bigger it is and vice versa. Conversely, both the zipon's velocity and size are fixed and expressed in its orbiting structures of magnetic strings. A standard magnetic moment is used as the measure of that velocity, which correspondingly is also a measure of the zipon's size. This measure is based on the time it takes for one zipon to replace another zipon in its orbit in a magnetic field. The following is an example of this complex interaction.

A single, isolated truant from the nebula may be compelled to move through space and in time towards a hidden, structured, magnetic field in response to the immutable imperative that is, here, based an a magnetic attraction. Then, in this example, say 5 zipons in those strings replaced each other in the same time that it took for that dipole to decay in size and to increase in velocity and to move through space in order to reach the zipons in that string. At the exact moment of its point of contact with the field that isolated dipole would effectively have transmuted from a truant to a zipon and it would now be within the boundary constraints of the field. And also at that moment its velocity and size and distribution of charge would equal that of the zipons in the field.

However, the dipole's interaction with the zipons in that magnetic field would be partially unsatisfied, as it would not be able to break that coherent string structure in order to attach and thereby satisfy its charge requirements. It would, nonetheless, have expended energy in this partial interaction with the field, which was both initiated and compelled by the immutable imperative.

The amount of energy transferred would be inversely proportional to its reduction in size and to its increase in velocity as it approached those magnetic field strings. Then as a result of that attractive but partial interaction with the field, and because of the inevitable and momentary proximity of opposing charges from the field zipons, the dipole would be attracted and would slow down. As mentioned, a decreasing velocity results in an increasing size. Immediately thereafter the dipole would again begin a transmutation back into a truant. And ultimately, its size would resolve to be as big, and its velocity to be as slow as, when it first began its movement towards the field, or when it first emerged in the nebula, whichever was the latter.

The time taken for this dipole's re-emergence into the nebula, as a truant and after its interaction with the field, would be precisely equal to another 5 standard magnetic moments. But this does not represent any further displacement of the dipole through space. In other words, the dipole remains within the location of its earlier interaction, albeit that the field continues to spin.

Therefore the truant used in this example, would be 5+5/2 magnetic moments big. It would have moved 5+5/2 = 5 magnetic moments' distance through space. And the length of time taken for each interaction with the field, would be 5+5/2 = 5 magnetic moments frequency. In this way the size of that dipole, the distance travelled and the frequency of its interaction with the magnetic field would be synonymous measurements.

Alternatively, and as a result of the dipole's movement towards the field, it is also possible that the momentary charge presented to the zipons in the field's strings may be repellent. In which case, at the time that the dipole moved within the boundary constraints of the field, its velocity would continue to increase and its size would continue to decrease as it transmuted into something even smaller than a zipon. Such a dipole is here termed a quark. Its size and velocity would then put the quark outside the boundary constraints of both the magnetic field and the nebula, both.

By definition truants and quarks and, through the process of transmutation into those particles, even some zipons here represent single dipoles. And it points to the possibility that there is no defined potential limit to the size of either the quark or the truant on either side of the magnetic field. Theoretically they could each transmute into an almost infinite variety of sizes with an infinitely varied velocity, which combinations would only loosely relate to the initial force at which each dipole was first expelled from the field. But without having another dipole to anchor it, or some partnering dipole with which it could both interact and orbit, its interaction with the field and with other dipoles would be arbitrary, chaotic and random.

In line with the immutable imperative dipoles could attach to each other to form composites. As composites they may then express a stable orbital interaction both with each other and with the field. We start with a 2-dipole composite from the nebula. Each of those dipoles would have two charges, the sum of which would then neutralise that particle's charge, being 2 + 2 dipoles/2 charges = 2, with the field having a localized single charge, making that composite imbalanced against a field, (Fig. 7).

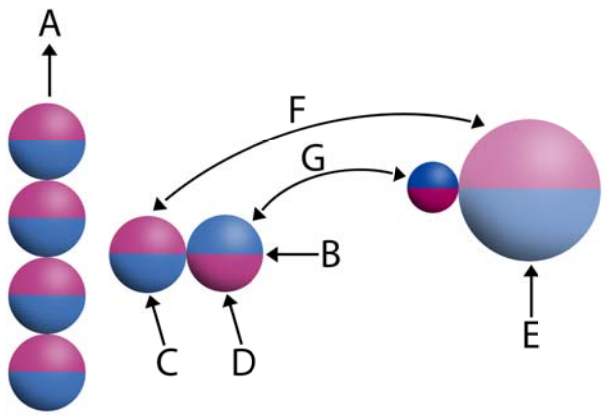

FIGURE 7
INTERACTION OF PHOTONS WITH A STRING

a) ***Justification (spin direction) of the string***
b) ***Justification of the photon***
c) ***Zipon attracted by proximate field zipons becomes a truant***
d) ***Zipon repelled by proximate zipons in the string becomes a quark***
e) ***Dipole composite at the extreme of their interaction with the string***
f) ***Dipole transmutes from a zipon to a truant***
g) ***Dipole transmutes from a zipon to a quark***

Both attached dipoles would transmute into zipons as they responded to and moved towards magnetic fields hidden inside the nebula. Having reached the boundary constraints of that field, they would then interact with the zipons that structured the strings of those fields. The two composite zipons may span more than one string in the magnetic field. The one zipon of that composite would be attracted and become bigger as it transmuted into a truant. To balance this, the other zipon of the composite would be repelled and become smaller as it transmuted into a quark. Then both dipoles would reverse those conditions, transmute back to zipons and then back into a quark and a truant respectively, subject to their exposure from more and varied charges from that orbiting field. In effect those two dipoles would have swapped lattices with each other in a rudimentary form of an orbit.

The sum of the standard magnetic moments, taken to reach each interactive moment with the field, would determine the scale, or size, of that composite as well as its velocity and frequency. These measures would also be synonymous with the distance covered through the field. The neutrality of the particle would compel it to move through the only neutral zone of the field, which would be at right angles to the field's orbit. This would carve out a straight line through that field, which would then radiate outwards in a line from a localized point in space, (Fig. 8)

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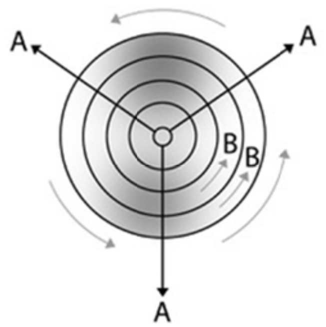

FIGURE 8
THE NEUTRAL ZONE IN A TWO-DIMENSIONAL MAGNETIC FIELD
Neutral zone

- ***a) Alignment of zipons in strings***
- ***b) Justification of the field***

As mentioned, the two dipoles of that composite would transmute and interact with each other at times that are determined by the number of magnetic moments that separate them from their interaction with the field. Therefore there may be significant variations to the 2-dipole composite's size, velocity or frequency. Theoretically there is also the potential to fractionalize its initial composite size thereby increasing the scope of that variation. This variable would be determined by the initial size of the two dipoles in the nebula and as they responded to the hidden fields.

In line with correspondence principles, therefore, a composite of two dipoles may form a photon, as these listed properties are consistent with the singular direction, the frequency variations and the constant velocity that is typical of photons. This model therefore also depends on the theorised structure of a universal, three-dimensional, toroidal, magnetic field that is proposed to structure space. This would provide the material to enable the photon's interaction and to determine the range of that interaction through space.

A 3-dipole composite may also be stable. This stability would depend on their two peripheral like charges being separated by a central unlike charge. While this arrangement would balance the charge distribution of that composite as required by the immutable imperative, the sum of its charge would, nonetheless, remain odd, or imbalanced, being 3 x 2 dipoles/2 charges = 3, with the field having one localized single charge, potentially allowing that composite to be balanced against the field, (Fig. 9).

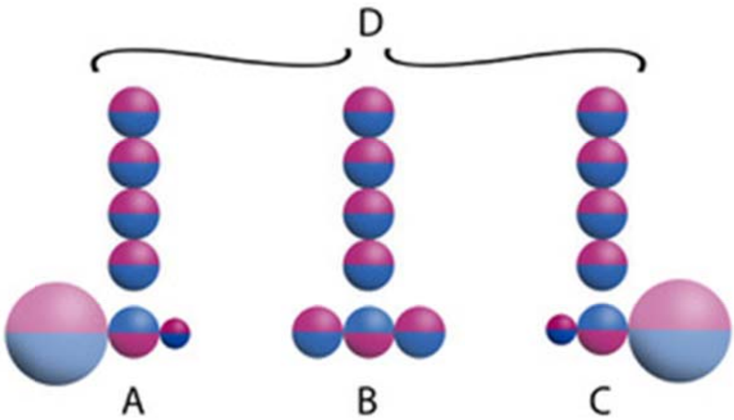

FIGURE 9
3 STAGES OF AN ELECTRON'S INTERACTION WITH A STRING

- ***a) Truant zipon quark***
- ***b) Transmutes to 3 zipons***
- ***c) Transmutes to quark zipon truant***
- ***d) Three stages of the dipole transmutations in an electron***

Initially, as with the photon, and also in response to the immutable imperative, all three attached truants would transmute into zipons as they moved towards the two-dimensional magnetic fields. Having reached the boundary constraints of that field this particle would be three zipons long and may therefore interact with zipons from more than one of the strings that structured that field. They would then transmute into a quark, a zipon and a truant respectively, in line with the immutable imperative. Within their own 3-dipole composite structure, the truant and the quark would each be attached to and continuously swap lattices with their central zipon, thereby describing a rudimentary orbit. The two peripheral dipoles, in turn, would also be variously attracted to and then repelled by the field's strings, which would induce their alternating transmutation into truants and quarks respectively.

The central zipon in that 3-dipole composite would in turn, develop a continuous orbital interaction against the zipons in that magnetic field string. It would then become locked in that orbit, inside that field's boundary constraints and against its justification. And as a result of this interaction, it would then also be able to offset the localized charge imbalance resulting from the single justification of the field and its own charge imbalance.

As mentioned, the two peripheral dipoles of that composite would transmute and interact with the central attached zipon at each alternate magnetic moment. The interaction of its zipon with the field would, correspondingly, be at every magnetic moment giving it a velocity of 2C. Therefore having no frequency variation there would also be no variation to its composite size. Theoretically, however, as with the photon, there may be a potential to fractionalize its initial composite size depending on the initial size of the three truants in the nebula as they responded to the hidden fields. But a listing of the extent of that potential is also beyond the scope of this thesis, (Fig. 10).

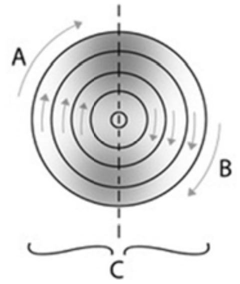

FIGURE 10
TWO-DIMENSIONAL MAGNETIC FIELD

- ***a)*** ***Arrows show the field justification or charge***
- ***b)*** ***Arrows show the opposite spin of that shared justification or charge***
- ***c)*** ***The two opposing spins that balance the entire field***

Therefore in line with correspondence principles a composite comprising three dipoles may form an electron. This is because these listed properties would fully account for their single negative charge value and for electrons' localised orbits at discrete levels within elements. Strings within the 2-dimensional magnetic fields, in effect, would relate to and correspond with the atomic energy levels that may then trap one or more electrons in a continuous orbit.

4-, 5-, 6-, 7- and 8-dipole composites would all variously subdivide into nuances, photons and/or electrons. However, a 9-dipole composite may be stable. This is because it would, essentially, comprise three electrons, which have been determined to be stable, (Fig .11).

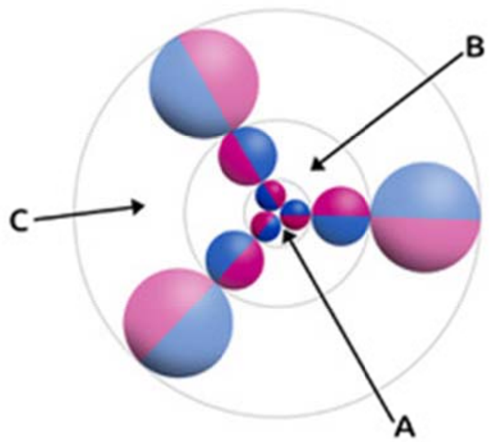

FIGURE 11
THE STRUCTURE OF THE PROTON

- ***a)*** ***3 x zipons***
- ***b)*** ***3 x truants***
- **c)** ***3 x bosons***

Three strings of three truants each may be randomly generated inside the nebula. They would each move towards a common point in a hidden 2-dimensional magnetic field in response to the immutable imperative. Then the size of each truant would be forfeit to a corresponding increase in velocity until each truant transmuted into a zipon as they reached the boundary constraints of the field. At which point the two peripheral dipoles of each of the three 3-dipole composite strings, would transmute into three quarks and three truants conjoined by a zipon at their centres. The quarks would be within each other's boundary constraints and would conjoin to form the anchor of a 3-branched 9-dipole composite. This would then form the basic structure of three electrons conjoined at their smallest peripheral dipoles.

It was determined that, in line with M+6 the very centre of a stable 2-dimensional magnetic field comprises a string of 6 dipoles, attached to each other's unlike charges. This is also, therefore, the only point in the field where there would be two localized charges resulting from the exposure to both sides of the field's justification through a single orbit. The complex charge of that 9-dipole composite would therefore propel it towards that field's centre where it could adjust its alignment to correspond to the two charges of that field as required.

The charge, or justification, of the three quarks of that 9-dipole composite, would correspond to and therefore oppose the charge or justification of the central magnetic string. This quark structure may then be catastrophically repelled from that composite because of its proximity. Then the two peripheral quarks of that repelled structure would transmute into a zipon and a truant respectively while the erstwhile zipon would transmute into a quark thereby forming an electron comprising a quark, a zipon and a truant.

An electron has a defined charge, and because that detached composite is now, effectively, an electron, it would conflict with one of the two charges at the field's centre. It would therefore be repelled away from that centre only to become caught and trapped in a continual orbit against the first coherent orbiting string of the magnetic field, where it would experience a localized single charge from the field as described. This orbit is consistent with the observed behaviour of electrons and, therefore, in terms of correspondence principles this potentiality could account for the emergence of one electron with every proton in the formation of elements, (Fig. 12).

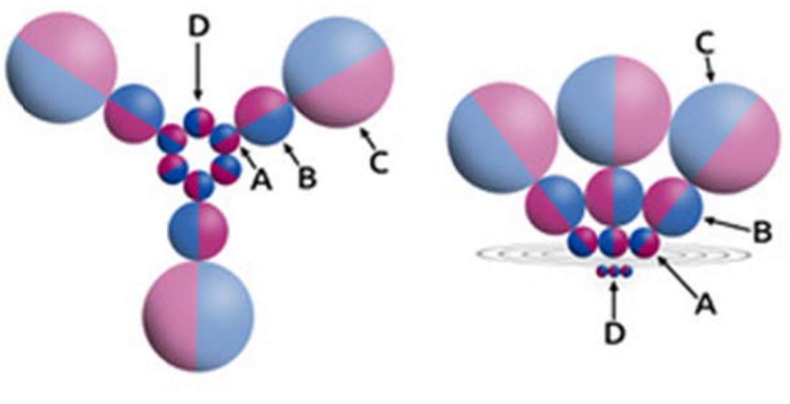

FIGURE 12
THE STRUCTURE OF THE PROTON'S ATTACHMENT TO THE FIELD

Left option

a) ***3 x zipons from the zipons in the field***
b) ***3 x truants from the erstwhile zipons***
c) ***3 x bosons from the erstwhile truants***
d) ***3 x zipons making a string of 6 at the base of the field***

Right option

a) ***3 x zipons from the zipons in the field***
b) ***3 x truants from the erstwhile zipons***
c) ***3 x bosons from the erstwhile truants***
d) ***3 x quarks from zipons from the magnetic field***

Potentially and also in line with the immutable imperative three of the six zipons in the centre of the 2-dimensional magnetic field may transmute into and replace those three lost quarks thereby adding three more particles to that composite structure. This string may then also require a localized orbit, which would be enabled as the quarks move out of the boundary constraints of the field. However the transmutation of the field's zipons to quarks, which then attach to that composite, is speculative and is only referenced because it would generate an even stronger bonding of that particle to the field. Which bonding, together with the composites' attachment to the very strings of the magnetic field, may contribute to the properties of the strong nuclear force. This hypothesis is explored in Paper 4 of 4.

After the exclusion of the three quarks to form an electron the remaining 6-dipole composite would include 3 x zipons and 3 x truants. The 3 x zipons would oppose the field's charge and be attracted and would therefore attach to three of the zipons in that field. The three zipons in that 6-dipole composite would then lose their orbital velocity and become bigger to transmute into 3 x truants. The three erstwhile truants from that 6-dipole composite would oppose the charge of these new truants. They would then each lose their orbital velocity and transmute into an even bigger particle, which is here termed a boson giving a total of 3 x bosons. These transmutations would result in a complex dipolar composite possibly including a quark at its base formed from three of the zipons in the field's centre. Follows would be the 3 zipons from the field now attached to the 3 truants, which transmuted from the zipons of that erstwhile 6-dipole composite. And attached to the three truants would be the 3 bosons that transmuted from the truants of that erstwhile 6-dipole composite.

CONCLUSION

The indications are that these three stable particles, being the photon, the electron and the proton, may indeed be composites of dipoles but this is still subject to a reconciliation of all their properties including the size ratio of the proton to the electron and to their known velocities in relation to C. This deeper analysis is required and resolved in Paper 3. At this stage the argument points to an outline of their known characteristics and their movements in space, which correspond accordingly and respectively.

The argument, related to the transmutation of nuances into photons, electrons and protons, has been advanced based on the concept of random conjugations of dipoles. However, the need for symmetry is a critical condition, required to underpin the stability of all universal and material constructions. And this symmetry may be challenged by the arbitrary and random nature of dipolar attachments from truants in the nebula. Rather there is the possibility of a greater orderliness if the magnetic field itself generated its particulate material from dipoles extrapolated from that field and from the magnetic strings.

This concept is persuasive, the more so as, not only would it result in the generation of varied elements, but it would also explain the inevitable reduction to the atomic radii as the elements gained in complexity. So it is, for example, that the hydrogen atom spans a far greater area than the iron atom. If the 2-dimensional strings comprising the magnetic fields of that element sacrificed their structures to supply the dipoles required for those elemental particles, then indeed, the number of the strings would be forfeit and the diameter of the element would shrink correspondingly.

Again, in terms of correspondence principles, this conclusion may be correct as the more complex atoms are, typically smaller in diameter than the less complex elements. In which case, there is a potential to develop the periodic table from an algorithm applied to those 2-dimensional strings, which structures are proposed to form the hidden skeletal frame of the atom. This study is outside the scope of this thesis but is a desirable consequence and would constitute proof of hypothesis beyond the correspondences that are exposed in these arguments.

The composite of the neutron has been omitted from this paper as the neutron is not strictly a stable particle, having a half-life of 10.3 minutes outside of the nucleus. Its size is, however, also resolved in Paper 3.

All illustrations done by Daniel Wright