Aetherions, preons, and the aether: A unified theory of the presently known

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Abstract: We propose that freed aetherial quanta become elementary particles named aetherions, and that the preons of the ABC Preon Model are constructed from the aetherions. We further propose that the aetherions have at least two components: One of unit-spin and another of half-integer spin. The unit-spin component and orbital angular momentum of the aetherions are proposed to be strongly coupled to the aether, and the resulting twisting of the solid aether leads to the force of preonic and nuclear binding. As a result of these proposals, all material particles are seen to consist of aetherions, and the nuclear, electromagnetic, and gravitational forces are all recognized as simple aetherial phenomena. This framework unifies all currently known physics by describing it in terms of aetherions and their interactions, bindings, displacements, and flows. © *2025 Physics Essays Publication*. [http://dx.doi.org/10.4006/0836-1398-38.3.173]

Résumé: Nous proposons que les quanta éthériaux libérés deviennent des particules élémentaires nommées aetherions, et que les préons du modèle ABC des préons soient construits à partir de ces aetherions. Nous proposons en outre que les aetherions possèdent au moins deux composantes: Une de spin unitaire et une autre de spin demi-entier. La composante de spin unitaire et le moment angulaire orbital des aetherions sont proposés comme étant fortement couplés à l'aether, et la torsion résultante de l'aether solide conduit à la force de liaison préonique et nucléaire. En conséquence de ces propositions, toutes les particules matérielles sont considérées comme étant constituées d'aetherions, et les forces nucléaire, électromagnétique et gravitationnelle sont toutes reconnues comme de simples phénomènes éthériaux. Ce cadre unifie toute la physique actuellement connue en la décrivant en termes d'aetherions et de leurs interactions, liaisons, déplacements et flux.

Key words: Aetherions; Preons; Aether; Elemental Particles; Fundamental Forces.

I. INTRODUCTION

Searches for a "Theory of Everything" seek to arrive at a unified theory of physics wherein all known particles, fields, and forces seamlessly coexist within a common framework. Ever since the Dirac Equation[1] revolutionized physics, the sought-for common framework has been predominantly mathematical in nature; strict physical modeling was set aside long ago. This has led to the enormously complex Lagrangian of the Standard Model, which to its credit includes all known particles along with the electromagnetic, strong, and weak forces. But despite its great complexity, the Standard Model famously fails to incorporate gravity. For gravity, the general theory of relativity is turned to, but it is not compatible with the Standard Model in important ways.

In this paper and in earlier papers,[2–6] we take a very different approach. We build from a physical model, not a mathematical one. From that physical model, mathematical expressions are derived, and tests of nature are proposed.

In this paper, we will aim toward unifying that which is presently known, rather than pursuing "a theory of everything." Indeed, with theories based on physical models, we may never achieve a theory of everything: Once elemental physical entities are proposed one can always ask the follow-up question "and what are those entities made of?"

The recently published paper on the quantum luminiferous aether[2] has already achieved a unification of electromagnetism and gravity: It derives Maxwell's Equations, the Lorentz Force Equation, and equations of gravity from the same aetherial model. The equations of gravity derived therein meet all the classic tests of general relativity, become Newton's law of universal gravitation in the appropriate limit, and identify the source of dark matter. The quantum luminiferous aether begins its derivations by looking at two aetherial substances, each made up of aetherial quanta. These quanta are fermionic (they have half-integer spin), and they contain, at minimum, tension and quantum pressure fields. Here, we will name those aetherial quanta "aetherions" and give them the symbols $Æ_P$ and $Æ_N$ for the positive and negative aetherions, respectively. While electromagnetism and gravity are successfully treated,[2] nuclear forces remain to be described.

Previous works on the ABC Preon Model[3,4] propose an alternative to the quark and lepton model, showing how quarks and leptons can be constructed from particles called preons. Since quarks and leptons are a result of the ABC Preon Model, the successes of the Standard Model in cataloging all observed particles are retained. However,

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some discoveries are reinterpreted as high energy preon events in a way different from the Standard Model and several predictions beyond those of the Standard Model are also made.[4] In addition to reducing the number of elementary particles from 61 to 8, the ABC Preon Model also identifies what is known as the weak force as a radioactive decay process, and not a force. This reduces the number of known forces from four to three. Hence, the ABC Preon Model describes nature with a simpler set of elementary particles and forces.

While the ABC Preon Model successfully reduces the number of elementary particles and forces, there are reasons to believe that a further simplification may be possible. (1) It is to be expected that the uncharged A preon would be lighter than the charged B preon, since classically one would expect that the energy of charge confinement would add to the mass. Yet the A preon is heavier than the B preon. (2) It would also be expected that a true elementary particle model would involve particles with unit or half-unit quantum numbers, yet the C preon has an electric charge of 2 and a neutrinic charge of 3. (Neutrinic charge was introduced as a new quantum number associated with a proposed neutrinic force that binds the preons into leptons and hadrons.[3,4] In addition to binding preons, the neutrinic force is the force of nuclear attraction.) (3) With the advent of the quantum luminiferous aether,[2] it is desirable to unify the third force of nature into the aetherial theory so as to unify all presently known physics into a single, physical model.

II. NEUTRINIC FORCE HYPOTHESIS: STRONGLY COUPLED ANGULAR MOMENTUM CAUSES AETHERIAL TWIST

The quantum luminiferous aether does not investigate or treat spinning or orbital motion of elementary particles, and here we propose that certain spinning or orbital motions lead to the strong neutrinic force by twisting the aether. Yet recall that motion of free aether through the nominal attached aether is shown to result in an electromagnetic flow force within the aether,[2] and in the case of particles with electromagnetic spins and orbits, this will also lead to a twisting of the aether, and that effect is not strong. For this reason, we propose that there are different types of couplings between the aether and moving particles. Weak couplings lead to the electromagnetic flow law and a gravitational flow speculation as already described.[2] And now a third coupling, a strong-coupling, will be proposed as the physical mechanism underlying the neutrinic force.

Twisting of the aether is resisted by the internal aetherial force fields, and therefore twisting results in a higher energy state of the twisted aether. A second overlapping particle of opposite angular momentum could alleviate the twisting, and this effect will lead to an attractive force between two particles of opposing angular momentum. This force will be short ranged. Two rotating particles will lead to a dipole–dipole potential that falls off as $1/r^3$. Also, significant cancellation of the force will exist in regions outside of two overlapping dipoles, further reducing the range of the force.

Qualitatively, this short range aligns with what we expect for the nuclear force.

III. THE STRONGLY COUPLED FORCE FIELD

The aetherial model[2] specifies four force fields within the aether: Tension, quantum pressure, delta, and gamma. In the nominal solid state of attached-aether, the inward acting tension force balances the outward force due to quantum pressure. A third force arises when aetherial quanta are freed from the binding of the solid to form detached-aether (free aetherions). When this occurs, the detached-aether pushes like-kind attached-aether outward and pulls unlike-kind attached-aether inward with a force called the delta force. A fourth force arises when energy (such as mass) reduces the quantum pressure and tension forces asymmetrically. This effect again leads to aetherial displacements and an associated force called the gamma force. Now a fifth force, the nu force, is proposed as resulting from strongly coupled angular momentum that drags against the aether, resulting in aetherial twisting.

IV. PROPERTIES OF THE AETHERIONS

Aetherions are individual aether quanta. As such, they are made up of their internal tension and quantum pressure fields. When bound into the aetherial solids, they may also contain delta, gamma, and nu force fields. When bound into the aetherial solids, their inertial mass is given by their internal field energy, including the gravitational potential energy, divided by c^2. Since they obey the Pauli exclusion principle, they are fermions. For aetherions freed from the solid state, the net detached-aether density (the positive-detached-aether density minus the negative-detached-aether density) is proportional to electric charge density. (See the earlier work[2] for details on all the attributes just listed.) Here, we will postulate that when freed, the aetherion maintains quantum pressure and tension fields, and that its mass is again determined from the associated field energies. Here, all spin and orbital momenta will now be expressed in units of $\hbar$. We will now propose that the aetherion Æ$_P$ (Æ$_N$) has a strongly coupled spin of $+1$ (-1), and a secondary spin of $-1/2$ ($+1/2$), presumably with one component field (either the tension field or the quantum pressure field) spinning with unit strongly coupled spin and the other component spinning with a half-integer spin that is not strongly coupled. This leaves the aetherions as fermions, as was prescribed earlier. We will also propose that the aetherion Æ$_P$ (Æ$_N$) has an electric charge of $+1$ (-1). Here, we will use the previous preonic notation[4] to now annotate the aetherions: The preceding subscript is the neutrinic charge, while the trailing superscript is the electric charge. Æ$_P$ and Æ$_N$ become $_{+1}Æ^{+1}$ and $_{-1}Æ^{-1}$, respectively.

V. BUILDING THE ABC PREONS FROM AETHERIONS

Next, we propose that the preons are either stand-alone aetherions or they are constructed by two aetherions orbiting each other and bound by an included neutrino. This construction of composite preons is consistent with the earlier

binding of preons into hadrons and leptons which included a neutrino quantum in the binding. The preons $_{-1}A^0$, $_{-1}B^{-1}$, and $_{+3}C^{+2}$ (and their antiparticles) were proposed earlier.[3,4] We now propose that neutrinic charge is simply the strongly coupled spin, and we will affix a sign (to be discussed below) to represent a direction of the strongly coupled spin. (The neutrino, ν, has a strongly coupled spin of 0 and an electric charge of 0.)

The $_{-1}B^{-1}$ preon is proposed to be a negative aetherion: $_{-1}B^{-1} = _{-1}Æ^{-1}$.

The $_{-1}A^0$ preon is proposed to be $_{-1}A^0 = _{-1}Æ^{-1}\nu_{+1}Æ^{+1}$ with $_{-1}Æ^{-1}$ orbiting $_{+1}Æ^{+1}$ and including a binding neutrino. The strongly coupled spins of the $_{-1}Æ^{-1}$ and $_{+1}Æ^{+1}$ oppose each other which leaves the $_{-1}A^0$ preon with its strongly coupled orbital angular momentum of -1 (see below for the sign), and since the $_{-1}Æ^{-1}$ and $_{+1}Æ^{+1}$ have opposite electrical charge, $_{-1}A^0$ has zero electric charge.

The $_{+3}C^{+2}$ preon is proposed to be $_{+3}C^{+2} = _{+1}Æ^{+1}\nu_{+1}Æ^{+1}$: An $_{+1}Æ^{+1}$ orbiting an $_{+1}Æ^{+1}$ with a binding neutrino. The strongly coupled spins of the two $_{+1}Æ^{+1}$'s are aligned with each other. The orbital angular momentum is also aligned with the spins, leaving the $_{+3}C^{+2}$ preon with a strongly coupled spin of 3, and with two $_{+1}Æ^{+1}$ aetherions of like charge, the electric charge of $_{+3}C^{+2}$ is plus two. Here, the physical reason for the alignment of the internal angular momenta is speculated to be that a like particle rotating against a similar like particle would result in a strongly coupled drag force so great that it is energetically preferred for the spins to be aligned rather than opposed.

Construction of the preons and antipreons is shown schematically in Fig. 1.

VI. IDENTIFYING NEUTRINIC CHARGE AS STRONGLY COUPLED ANGULAR MOMENTUM

By identifying the source of the neutrinic force with strongly coupled angular momentum, we now have a new
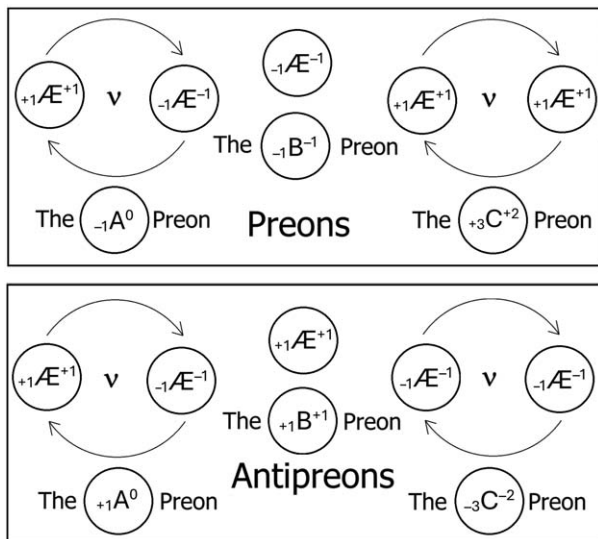

FIG. 1. Formation of preons and antipreons from aetherions. The B preon and antipreon are stand-alone aetherions. A and C preons and antipreons are composite particles, with neutrinos and orbital angular momentum contributing to their total angular momentum.

interpretation for the preonic binding. Instead of binding being an effect which tends to reduce a neutrinic charge, we now have an effect that aims to reduce strongly coupled angular momentum. The sign of the strongly coupled angular momentum is determined with respect to the members of the bound bodies. In the electron, we can define "+" as the strongly coupled spin direction of the substituent $_{+1}A^0$ antipreon, and hence the $_{+1}A^0$ has a strongly coupled spin of $+1$, while the substituent $_{-1}B^{-1}$ preon has a strongly coupled spin of -1. In the proton, the strongly coupled spin of the substituent $_{+3}C^{+2}$ preon can be used to define $+$ with the $_{+3}C^{+2}$ having a strongly coupled spin of $+3$, while the two $_{-1}A^0$ preons and the $_{-1}B^{-1}$ preon each have a strongly coupled spin of -1. Notice that the $_{-1}A^0$ preon and the $_{+1}A^0$ antipreon are the same particle, just rotated so that the spin reverses. Indeed, it would also be possible for the $_{+1}B^{+1}$ antipreon to bind with the $_{+3}C^{+2}$ by rotating the $_{+1}B^{+1}$ into a $_{-1}B^{-1}$ (the neutrinic sign becomes flipped) thus counter-aligning their strong-couplings, although this is not seen in nature. (The electric repulsion of a $_{-1}B^{+1}$ and the $_{+3}C^{+2}$ likely leads to an energy so large so as to preclude this binding possibility.)

VII. TOWARD A STRONGLY COUPLED QUANTUM MECHANICS

In the earlier preonic papers,[3,4] we have found that an electron is an $_{+1}A^0$ antipreon of mass $45.6\,\mathrm{GeV/c^2}$ bound to a $_{-1}B^{-1}$ preon of mass $34.8\,\mathrm{GeV/c^2}$. Yet the mass of the electron is only $0.000\,511\,\mathrm{GeV/c^2}$, orders of magnitude less than its constituents. Hence, the potential energy is a large portion (nearly equal to) the total energy stored in the masses of the constituting preons, and therefore we cannot use the Schrödinger Equation for our preonic quantum mechanics. For this reason, we should use the equations derived in other previous works.[5,6] Equation (19) from one earlier work[5] provides an expression for s-states that includes effects from both a monopole and a dipole–dipole term, repeated here as follows:

$$\partial^2\Psi/\partial r^2 + (2/r)\partial\Psi/\partial r + (1/r^2)\partial^2\Psi/\partial\theta^2$$
$$+ (\cos\theta/r^2\sin\theta)\partial\Psi/\partial\theta$$
$$= \left[m^2c^4 + 2E_n\{K_1/r + K_2(1-3\cos^2\theta)/r^3\}\right.$$
$$\left. - E_n^2 - \{K_1/r + K_2(1-3\cos^2\theta)/r^3\}^2\right]\Psi/h^2c^2. \quad (1)$$

Solving Eq. (1) can, in principle, be done numerically, and this may allow for a calculation of the lepton masses, since the A and B preons may both lie in s-states. (However, the composite nature of the A may add considerable complexity to the calculation.) To calculate preon masses from the aetherions, further development of a realist quantum mechanical equation will be required to include the p-state (orbital momentum) that is hypothesized to exist when the aetherions combine to form the A and C preons.

VIII. RESULTS

With the above hypotheses in place, we can now understand why the A preon has a larger mass than the B preon:

The A preon contains two charged atherions, while the B preon contains only one. We now understand why the C preon has quantum numbers greater than one: It is a composite entity. We now have elementary particles (the aetherions) with the expected half-integer and integer quantum numbers.

The mass of the unbound aether quantum is now known, as it is the mass of the $_{-1}B^{-1}$ preon, found earlier[4] as 34.8 GeV.

By speculating that the aetherion is composed of one field with strongly coupled unit-spin and a second field of uncoupled half-unit spin, and further speculating that the unit-spin component is responsible for electromagnetic effects, the factor of 2 in the electron's magnetic moment is understood, since the underlying spin leading to the magnetic moment is now unity, not one-half. The g-2 portion is qualitatively expected to arise from the $_{-1}B^{-1}$ preon perturbing the $_{+1}Æ^{+1}$ and $_{-1}Æ^{-1}$ orbits within the $_{+1}A^0$ antipreon. Since the $_{-1}B^{-1}$ preon is a negative aetherion ($_{-1}Æ^{-1}$), it will electrically repel the $_{-1}Æ^{-1}$ orbit and attract the $_{+1}Æ^{+1}$ orbit, leading to orbit deviations which increase the electron magnetic moment.

The atherion model unifies the strongly coupled force with the electromagnetic and gravitational forces as all three are now physical aetherial effects. Electromagnetism follows from aetherial displacements caused by moving or stationary detached-aether; gravity follows from aetherial displacements when moving or stationary energy (or mass) affects the tension and quantum pressure aetherial fields; and now we understand that the short-range nuclear force follows from aetherial displacements caused by strongly coupled angular momentum displacing the aether in a twisting fashion.

The origin of mass is now determined. Earlier,[2] we found that aetherial mass in the solid state comes from the energy of the internal fields of the aetherial quanta, and now we understand that all matter outside of the solid-state aether is also made up of aetherions. Hence, the origin of mass is identified as coming from field energies.

Great simplicity is achieved in our underlying physical model. The $_{+1}Æ^{+1}$ and $_{-1}Æ^{-1}$ atherions make up all preons, which in turn make up all known leptonic and hadronic matter and antimatter. The photon, neutrino, and graviton are not material particles in this modeling. Instead, the photon, neutrino, and graviton are wave-packets of aetherial displacements. The aether itself is made up of aetherions in a solid (attached) state. All particles are made up of aetherions in a free (detached) state. Hence, we have now arrived at an elementary particle model consisting of a single particle $_{+1}Æ^{+1}$ and its partner particle $_{-1}Æ^{-1}$, and those two particles and their interactions, bindings, displacements, and flows make up everything presently known.

IX. CONCLUSION

This paper and the prior works[2–6] answer many deep questions facing physics today, but as noted above in the Introduction, a physical theory will always lead to the next round of questions. Here, we have provided some quantitative answers in terms of conservation of quantum numbers for the strongly coupled force. While we have suggested an approach toward a strongly coupled quantum mechanics using Eq. (1), considerable work remains to be done to solve Eq. (1) for problems of interest.

The presently prevailing relativistic and point-like mathematical models have problems with paradoxes, singularities, and infinities. By returning to physical and absolute models, the aether, ABC Preon, and aetherion models allow us to obtain a simpler, deeper, and more complete understanding of nature, free from the problems facing physics today.[7]

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