

COMMON SENSE UNDERSTANDING OF QUANTUM MECHANICS

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December 4, 2025

Abstract

This paper suggests a concept for an aether flowing vertically into matter that potentially explains gravity and discusses a candidate model for the composition of such an aether. Such an aether composition could provide a mechanism for electromagnetism, and strong forces, as well as, providing a sensible mechanism for quantum gravity. Further the existence of an aether could also help many other physical phenomena make better sense. The null test result of the Michelson-Morley experiment resulted, in the conclusion that there was no aether, and that conclusion remains today. The basis of the Michelson-Morley experiment was the assumption that the earth traveled through the aether; an assumption that overlooked the possibility that the aether flows directly and vertically into all matter including the earth from all spherical directions. For an aether to continuously flow into a mass, it must convert into something else that can flow back out again. Perhaps two or more aether components flow into matter, including vacuum energy, where these components somehow combine to form something else, such as thermal photons, which flow back out of matter. The inward flowing components cause a gravitational drag force while passing through matter but the outward flowing components do not. As the aether converges towards a spherical center, it must accelerate and I speculate that this acceleration is the cause of the gravitational time dilation, which in turn, results in the gravitational drag force. The thermal photons radiating into space would gradually give up energy to the aether of space until the photons dissolve back into aether components and vacuum energy. Electromagnetism, and strong forces could potentially be explained as an exchange of aether components between positive and negative charges. An aether could also help explain other phenomena such as the duality of light, mass and energy, vacuum friction, and the unexplained thermal energies radiating from planets. This paper suggests a possible composition of the aether, as well as, two experiments that could be performed with the potential of supporting an aether flowing into matter. Unproven ideas are offered to provoke new thinking.

GRAVITY CONCEPT

The assumption that the earth traveled through the aether was unjustified and most likely incorrect. A better assumption would be that the aether flows into all matter including the earth. The experimentally determined wave behavior of light strongly suggested that light traveled through a medium, like sound traveling through air. This medium was referred to as the aether. Since the earth moves around the sun and rotates on axis, it made sense to the experimenters that the aether flowed around the earth and that a leveled rotating interferometer would detect this aether. The resulting null test result, resulted, in the conclusion that there was no aether, and that conclusion remains today. With the aether flowing directly into the earth, the Michelson-Morley experiment would yield a null result. It might have worked better if the interferometer had been stood on its side. If an aether exists that flows into matter, many subsequent developments in physics based on there being no aether need reevaluation.

Consider that space is not empty; rather it is filled with a multi-component fluid consisting of particles; loosely described as an aether. For aether to flow into a mass, it must contain at least two components. Perhaps, one component would flow into matter where it is altered so that the altered component can flow back out again. Possibly a larger component flows inwards and the decomposed smaller pieces flow outward. Or, perhaps two or more aether components flow into matter where these components somehow combine to form something else, such as thermal photons, which flow back out of matter. The inward flowing components cause a drag force while passing through matter but the outward flowing components do not. This drag force would be gravity.

For visualization purposes, consider aether as a fluid that flows in a manner like a three-dimensional compressible gas flow with density gradients and flow velocity vectors. The flow complexity is driven by aether flowing into all masses, such as, the sun and the planets, whereby, these masses are moving through space and rotating. As such, for example, the aether flow into the earth would be influenced by the motion of the moon. Further, this suggests that relativity is with respect to matter; that is, the density, velocity, and direction of the aether flowing into matter governs many physical phenomena, including time.

For aether to flow into matter, it must converge. This converging flow must accelerate as it is continually flowing through a smaller and smaller spherical area; decreasing with the radius squared. Now consider the time variance due to gravity. Consider the experiment with two identical synchronized clocks where one clock was placed on a lower floor of a tall building and the second clock was moved up to a higher floor. After a time, the upper clock rejoins the lower clock. A comparison of time readings demonstrated that the upper clock ran faster than the lower clock. The concept of aether flowing into matter could explain this phenomenon. Here the aether flow through the lower clock would be moving faster than the corresponding aether flow through the upper clock. Apparently, the velocity of the aether flow through matter affects time, or put in another way, the rates of all physical processes used by the clocks slowed down as the velocity of the aether flow increased.

Now consider the twin paradox where one twin travels aboard a spaceship at relativistic speeds while the other twin remains on earth. When rejoined, the earth-bound twin was an old man while the relativistic twin remained young. The earth-bound twin saw his twin fly away at relativistic speeds, while for the relativistic twin, it appeared that the earth was receding away at relativistic speeds. The answer to this paradox is that the aether was flowing into the earth while the spaceship was moving through the aether. Viewed from within the spaceship, the aether was flowing through the spaceship at relativistic speeds, thereby, slowing all physical processes in a manner like the two clocks experiment.

The flow of aether through matter causes a gravitational force; possibly because the aether is accelerating as it converges towards the spherical center. As the accelerating aether flows through a material object, there is a gravitational time differential across the depth of the object; in a manner like the two-clock experiment. Therefore, the physical processes on the upper elements of the object move more rapidly than the corresponding processes on the lower elements, including those associated with the orbiting electrons; whereby the faster moving electrons of the upper elements of the object put a pressure on the slower moving electrons of the lower elements. This downward pressure is the force of gravity.

Aether consistently flows towards gravity wells with gradients of decreasing density along the way as the spherical convergence speeds the aether. Once aether has penetrated large matter, such as the earth, the spherical convergence speedup will be gradually compensated by the reduction in aether particles used to form thermal photons; such that the aether flow ceases at the gravitational center of the earth.

Now when an object moves through a uniform aether at a constant velocity where there is no acceleration of aether particles through the object, there is no resulting force applied to the object. Hence, the object continues to move with constant velocity, unless some other force is applied to the object. If another force is applied, the acceleration of the object results, relative speaking, in an acceleration of the aether though the object. This acceleration of aether through the object results in a slowdown of all time-related physical processes, resulting in an internal energy transfer from the object to the aether or to the source of the acceleration. The amount of internal energy transferred is essentially the property of mass. The denser the material, the greater the amount of internal energy transferred, that is, the greater the mass. This process is basically the same as the gravitational driven aether acceleration through matter. This is why the inertial mass of an accelerating object ($f=ma$) is the same as the mass associated with gravitational acceleration.

Planets radiate more energy into space than the energy received from the sun with the difference attributed to the leftover heat of planet formation and radioactive decay. For example, Jupiter radiates more than twice the energy it receives from the sun (1) but being a convective gas planet where warmer gases buoyantly rise within the atmosphere, it is difficult to justify substantial heat of formation remaining after four billion years and a gas planet should not have excessive radioactive material. This quantum gravity aether theory could explain the extra heat radiating from planets. The thermal photons radiating into space would gradually give up energy to the space filled aether until the photons dissolve back into aether components and vacuum energy.

BASIC CONCEPTS

Consider two basic ideas or principles. First, all wave behavior involves some kind of carrier fluid. Second, all forces are due to a gradient in something, likely a field of particles, such as the air pressure lifting the wing of an airplane. Physics points to several force fields, such as gravity and electromagnetic fields, without defining what a force field consists of, rather it is simply stated that such a force field exists. If a force field exists, then it is made of something. It is not too difficult to envision particles too small to detect by any available means, for example, consider the difficulty in detecting neutrinos.

The standard model of physics explains attractive and/or repulsive forces as an exchange of particles, such as an exchange of photons between two approaching electrons. How would one electron know when another electron was within range to negotiate an exchange of photons? This would require some source of communication between the electrons. Imagine, one electron phones up another electron and says you are getting too close, I will throw you a photon. If an electron was spinning out photons in all directions all the time, its batteries would go dead. However, if an electron was constantly converting one type of aether particles into another type, then the space between two approaching electrons would fill up with an excess of particles of the converted type, thereby providing a kind of repulsive pressure needed to push the electrons apart. The opposite type of conversion would happen with protons, that is, the proton would convert the electron converted aether particles back into the form before the electron converted it. A kind of back-and-forth conversion process. From a calculational standpoint, this aether pressure repulsion force should look somewhat like the photon exchange process. Since electrons do not have telephones or batteries, the photon exchange concept does not make sense, whereas, the concept of flowing aether particle fields does make sense. All well understood physics should make sense.

Physics has noted interactions with an unknown aether, for example, virtual particles that pop into and out of existence, or vacuum energy, or vacuum friction. If a quark pops into existence or out of existence, it makes sense that free quarks exist in the multicomponent aether. After all, experiments cannot detect a free quark as it does not leave tracks in experiments based on electromagnetic fields. Further, physics is filled with wave like behaviors, such as, electromagnetic waves and waves associated with matter particles, such as an electron, and consider the success of the Schrodinger wave equation. All this wave behavior must involve a fluidic medium of some type; an aether that fills the universe.

GRAVITATIONAL CONSTANT

The gravitational constant, G , cannot be theoretically predicted and is among the least precisely known of the fundamental constants (2). A flowing aether suggests that there must be density gradients in the aether, that is, the higher densities push particles along towards the lower densities, as the aether flows from free space into matter. The idea of density gradients suggests

the idea that the gravitational constant depends on the aether density, rather than being a universal constant. That is, the gravitational constant is not a universal constant at all.

Constants, such as Coulomb's constant, are based on short distances and, therefore, it is more reasonable to assume such constants are universally constant across the universe. However, because gravity is a long-distance force, it is not reasonable to assume the gravitational constant, G , is constant across the entire universe. After all, the gravitational constant has essentially only been measured at one point in the universe, that is here on earth, albeit, at several locations on earth. A measurement of the gravitational constant in inter-planetary or inter-stellar or inter-galactic space could be vastly different from those measured on earth. The measurements of the gravitation constant varied, somewhat, from location to location on earth, also with different times at the same location. Albeit, these variations in measurement were very small and may be due to measurement error, the variations could be due to variations in the composition and uniformity of the earth surface, which could slightly alter the localized flow of aether into the earth. Further, the position of the moon could also alter the localized aether flow resulting in slight variations in measurements at the same location but at different times. Perhaps such variations in G measurement with time could be correlated with the cyclic position of the moon. Whereas, it seems reasonable to assume that electrical constants which act at short distances may be universal across the universe, it is unjustified to assume that when something acts over great distances, but measured at essentially one location in the universe, that it is constant throughout the entire universe.

Consider the ramifications of a variable gravitational constant. The concept of dark matter evolved from the application of Kepler's equation, along with Newton's laws, to the motion of stars in distance galaxies. The concept of dark matter was born on the assumption of a constant gravitational constant. Rather than inventing the concept of dark matter to explain those distant observations, a variable gravitational constant could also have explained those observations. Even though, the dark-matter concept results in vastly greater quantities of dark-matter than regular matter, not one single particle of dark matter has been identified in any of the variety of complex experiments performed. At some point, we should back up and figure out where we went wrong. Instead, the application of Kepler's equation to the motion of distance stars should be used to estimate how the gravitational constant, or more appropriately the aether density, varies with respect to matter.

One argument for maintaining that the gravitational constant is a universal constant is the success of Einstein's equation of general relativity, which assumed G was a constant. However, this equation results in a conclusion that space and time curves, which makes no logical sense. Consider redeveloping this general equation where G varies with x , y , and z ; but x , y , and z remain straight lines. The resulting contour lines, or rather contour surfaces, of constant G would appear to look something like Einstein's lines of space curvature. These gradients in G , corresponding to variations in aether density, cause aether to flow. The inclusion of the three-dimensional aether flow velocities into the equation would provide the time factor. The application of this revised equation should also successfully predict physical phenomena.

Typical illustrations of space time curvature are two-dimensional, but space has three dimensions. Space is space; it does not have a shape.

There is some convoluted logic associated with the measurement of G and the concept of dark matter. According to theory, dark matter affects gravity and constitutes around 85% of the total mass of the universe. Since there are several complex experiments being performed that look for evidence of dark matter, apparently dark matter is expected to be everywhere, including within the earth. But the earth is being treated as consisting of primarily ordinary matter, so apparently, the distribution of dark matter is not considered to be uniformly distributed with ordinary matter. However, it seems reasonable that if the earth contains dark matter, the spherical lead weights in the Cavendish experiment, that resulted in the determination of the gravitational constant, also contained dark matter; meaning the impact of dark matter on gravity is at least partially embedded within G. Therefore, when looking at distant galaxies, the dark matter associated with the ordinary matter has already been, at least, partially accounted.

TIME

What is time? Time is not a physically real parameter; rather it is simply a mathematical term that compares relative motions. Everything in the universe moves forward; however, the rate of forward motion varies. Clocks, such as an atomic clock, are devices based on a physical phenomenon with repeatable replicable motion. Time variance, such as the two clocks at different elevations, is caused by a rate variation in these repeatable motions. This time variance appears to be due to the velocity of the aether passing through matter at the respective locations. Further, since this time variance affects small particles, such as, the decay of muons, the aether particles flowing through matter must be small enough to readily pass amongst the assembled quarks of particles, such as protons, implying the aether flow through matter may somehow be related to the strong nuclear force.

VACUUM FRICTION

The concept of vacuum friction has been under consideration, that is, the possibility that matter moving through space, or through an aether, is affected by a kind of friction. Gravitational waves carry away energy. Again, wave behavior suggests a medium. Observed binary rotating neutron stars lose energy, via gravity waves, gradually approaching each other, and will eventually combine (3). Surely all movement of matter results in energy losses in a similar manner. If moving matter loses energy to the aether, then this energy goes someplace; perhaps vacuum energy, or many a better term would be aether energy, that subsequently flows into matter, and subsequently becomes thermal energy.

It stands to reason that photons moving through space can also slowly lose energy. This concept, known as tired light, was studied, and generally discredited. However, those evaluations were based on photons interacting with intervening matter or other photons. The tired-light concept needs to be reevaluated based on photons traveling through an aether medium.

We know that gravity affects light, where light has been observed to bend while passing by the sun, as well as, observations of distant gravitational lensing, not to mention black holes. We know by way of observing Pulsar radio signals that high frequencies radio waves travel somewhat faster than the lower frequency waves (3). We know that the speed of light varies when passing through transparent matter, such as water or glass. Further, if time varies with an object's velocity, as verified by orbiting satellites and related GPS systems, then all physical processes associated with time measurements must also vary. These physical processes likely include the speed of light. Given, aether can bend light and likely affects light speed, it is not too difficult to envision aether causing some form of vacuum friction to rob energy from passing photons. The rate at which photons lose energy could well be somewhat frequency dependent, especially when considering higher frequencies apparently travel somewhat faster than lower frequencies.

As photons of light travel through space, these photons are affected by the maze of increasing and decreasing gravitational forces that light traverses, with light bending around or passing through galaxies and all the variety of masses out there. Light loses energy, thereby, becoming redder when going from higher gravity to lower gravity and, conversely, light gains energy becoming bluer when moving from lower gravity to higher gravity. Thus, the energy of light is continually being transferred into and out of the gravitational driven aether, as light travels through space. From an engineering standpoint, when transferring energy from one form of energy to another form of energy, and then back again, energy is lost, i.e., entropy increases. It stands to reason that light transiting a varied gravitational field will gradually gain or lose energy to the varied gravitational field with an increasing entropy of light. Further the efficiency, or increasing light entropy, may well be frequency dependent. After all, from an engineering standpoint, higher efficiencies are generally achievable at higher energy levels. Thus, low frequency light could lose energy to the aether more rapidly than does higher frequency light, which could explain the observations leading to the concept of dark energy. Energy residuals remaining in the aether might be considered vacuum energy or aether energy.

Observations have found faraway supernovas to be dimmer than expected by current theories, which suggested an accelerated expansion of the universe. These observations form the concept of dark-energy, which, along with, dark-matter constitute most of the known universe, albeit, experiments designed to find the Dark cannot locate a single tiny piece of it. If lower energy photons lose energy to vacuum friction faster than higher energy photons, this could explain the observations leading to the concept of dark energy. Physics contains such concepts as vacuum energy, vacuum friction, and virtual particles, such as, quarks popping into and out of existence, all while, discounting the existence of an aether. Conflictingly, dark energy is suspected to be a form of vacuum energy, again suggesting a medium. Experiments have not been able to detect, neither dark energy or dark matter, probably because neither exists; rather there are better explanations for the experimental observations.

DUALITY OF LIGHT

Light behaves both as a wave and as a particle; an unexplained contradiction. Consider the possibility that each photon consists of one 1/3-positive quark and one 1/3-negative quark, very tightly bound by the strong nuclear force; so tightly bound that aether particles cannot pass between the two quarks; hence a photon has no mass. Also consider such a photon rotating while moving through the aether, such that, it causes waves in the aether; the faster the rotation, the higher the wave frequency. The twin-quark particle causes the particle-behavior when impacting matter, while the wave in the aether results in the wavelike behavior. Some other aether characteristic determines the speed of the light. Why the photon moves at the speed of light likely has something to do with how fast the aether particles can move; akin to the movement of air molecules associated with the speed of sound. As gravity bends light, it is likely due to the flow of the aether partially carrying the photon along with it, and, in part, because the acceleration of the aether and its decreasing density means the lower side of the light wave moves in a lower aether density than the upper side. A slight non-symmetry in wave form that could also slightly alter the beam direction.

Consider the annihilation of an electron with a positron resulting in two photons with energies associated with their respective masses ($E=mc^2$). Now consider the possibility that electrons and positrons are not prime particles; rather each consists of three tightly bound 1/3-quarks, so that, the annihilation provides a total six quarks; three negative quarks and three positive quarks. Four of these quarks form the two resulting photons and the two remaining quarks simply drift off into the aether. While the strong nuclear force would hold the quarks tightly together in the electron, the positron, as well as the resulting photons, the photon strong force would involve less energy than that of the electron and positron, where the excess energy spins the photons creating the aether waves. Or, perhaps the excess energy is the aether wave energy, which in turn spins the photon. The strong nuclear force associated with a photon would be substantially stronger than the strong nuclear force associated with the electrons and positrons. Certainly, the masses associated with the electron and positron does not just magically disappear into nothingness while the photons magically appear out of nothingness. There must be some intervening process connecting the beginning and the end.

The two quarks forming a photon would be bound so closely together that accelerating aether particles cannot pass between the two quarks; hence a photon has no mass. The three quarks of an electron or a positron would be tightly bound, but not so tightly, as to preclude all accelerating aether particles from passing amongst their three quarks; hence these particles have some small associated mass.

Now consider the electron tunneling phenomenon where an electron passes through a solid object. What if the electron decomposes, under certain conditions, into three 1/3-negative quarks upon impacting the obstruction, but the associated energy in the form of an aether wave passes through the structure, whereafter, it reforms into an electron using the first available free quarks, whether these quarks are the original quarks or others. Maybe such behavior could further explain the two-slit experiment, where photons are considered to pass simultaneously through both slits. Perhaps, the photon itself goes through one slit, or the other slit, but the associated

aether wave passes through both slits, or perhaps, the photon decomposes and then reforms again on the other side.

STEADY STATE UNIVERSE

The 'Big Bang' theory was based on essentially two experimental observations, i.e., the Doppler shifting of starlight and the distant background microwave radiation. The tired-light concept offers an alternative explanation to these observations, allowing consideration of a steady-state, or perhaps, a quasi-steady state universe. Assuming photons moving through space remain unchanged as they travel through space is another unjustified assumption. Photons losing energy in transit would appear as doppler shifted to earth telescopes; observations that resulted in the concept of an expanding universe, i.e., the big bang theory. Normal starlight having traveled 13.8 billion light years may well have been reduced to microwave radiation, via aether friction, or the variations in the gravitational fields.

If the universe was only 13.8 billion years old and we see 13.8 billion light years in any direction, then the earth is basically dead center in a spherical universe 27.6 billion light years in diameter, plus the rate of expansion times 13.8 billion years. If the earth was nearer the edge of the exploding/expanding universe, a telescope looking towards the outer edge of this universe would see nothing instead of the vast numbers of distant galaxies. Newer telescope observations are finding massive distance galaxies at the edge of the known universe that are estimated, according to the big bang theory, to be only a few hundred million years old. Therefore, there is a conflict between the physics of forming high-energy galaxies and the time scales of the Big-Bang theory.

A better explanation would be that star light having traveled 13.8 billion light years would have lost sufficient energy that these photons were reduced from visible star light down to microwave photons or less before arriving at earth; and doppler shifting is just tired-light. The further light travels, the more energy the light losses so the universe is not really expanding. Time to reexamine the steady-state universe concept.

Black holes could be the reverse of entropy where intense gravitational pressures crush and breaks down matter into some form of extremely fine constituent parts; parts so fine that gravity no longer affects them; likely sub-quark particles. As such these fine parts, undetectable, drift out of the black holes, back into open space, where they somehow recombine, via vacuum energy, forming protons and electrons, i.e., hydrogen that in turn form new stars. The whole process would cycle endlessly. All in all, a much more reasonable concept than the entire universe consisting of hundreds of billions of galaxies, or is that trillions, exploding out of a singularity.

ELECTROMAGNETISM

Energy and electromagnetism are directly interrelated. Going back to the principles that wave behavior involves some kind of carrier fluid and forces are due to a gradient in something, likely a field of particles. Then to explain electric fields, the aether must contain another set of particle fields, or more likely, use the gravitational particle fields in a different manner, where one type of particle is attracted or driven to a positive charge and another type of particle is attracted or driven to a negative charge.

Consider two parallel plates where one plate is positively charged and the other plate is negatively charged, i.e., a simple linear electric field. This indicates that there are two types of particles fields, where one type is attracted to the negatively charged plate, and the other type to the positively charged plate. Consider that each type of charge converts its attracted particles to the other type of particle, so that, there is continuous flow of particles back and forth between the two types of charged plates. The respective particle density gradients would drive the particles flows. With the two types of particle fields flowing in opposite directions, any charged matter located between the two plates would be propelled towards the plate of opposite charge. The real question here is how does one type of particle convert to the other type, when in contact with a charged object. Perhaps, one type is decomposed into smaller pieces, which are in turn, recombined at the opposite charge.

In an individual atom, there would be similar particle flows back and forth between positively charged nuclei and orbiting electrons, albeit, much more complicated due to the geometry and electron motion, such that, the exchanges would also involve interactions amongst the atoms. There would be lines, or contours, of constant electrical aether density surrounding the positively charged nuclei, so that, orbiting electrons would follow these contours of constant aether density and since the orbiting electron would not be changing its orbiting energy level, it would not be accelerating, and would not radiate photons.

Now consider that ordinary free space contains fields of both types of these particles in relatively equal distributions and densities. Without the presence of charge separation, the two types would be relatively uniformly mixed with an equal distribution; hence no significant electric fields. As such, no net forces would be applied to ordinary matter. Now a charged particle moving through this neutral field could upset such a balance. If such a particle was a photon consisting of one positive quark and one negative quark rotating while moving forward at light speed, it could cause a wave separation of the two types of particle fields, where energy was both imparted to the fields and simultaneously recovered from the fields. This separation of the two types of particles could represent the most basic form of energy. Such a separation would establish wavelike electric fields. This process could also provide another mechanism where photon energy is slowly lost to the aether. Also, small separated-component waves could propagate through the aether without the involvement of matter or photons. Perhaps, such small waves could accumulate to form larger waves, in a manner like rogue waves in the ocean, and if the larger waves become significant enough, the associated energy could be large enough to spawn a photon or an electron/positron pair. This would require a ready supply of free-floating quarks in the aether field.

If an electron, for instance, travels through an electric field in a direction where it slows down, its reduced kinetic energy would be transmitted to the aether creating waves in the aether, for which, the energy along with a couple of free quarks could form a photon. This would be the observed behavior where an accelerated electron spins off photons.

Now consider the types of waves that might be possible with such an electrical two-component aether. First, as discussed, there would be a component separation wave associated with the passage of a photon, where energy was both imparted to the aether fields and simultaneously recovered from the fields; rate of which would likely govern light speed. Second, there could be wave separation waves not involving photons, which would propagate until the wave interacted with something else or dissipates. Consider the possibility that low energy waves, such as radio waves, are of this type rather than being photons. After all, experiments that demonstrated photon particle-behavior were based on higher energy electromagnetic waves. A third type of wave would involve the entire two-component aether waving without component separation. Such waves would not be electromagnetic in nature, but could well be gravity waves; also traveling at light speed.

Consider that the aether flows associated with gravity are the same as the aether flows associated with electromagnetism. The combined two component aether flows into matter, spherically accelerating, and, thereby, passing by or through nuclei and electrons, thereby altering the aether exchanges between the nuclei and electrons, thereby altering time. The faster the gravity driven aether flow, the greater this effect. These two-component aether flows, that are gravity driven into matter, could accumulate sufficient energy to combine with available quarks to form thermal photons, which subsequently slowly dissipates outward from matter into space, as thermal heat. This process would thereby reduce the gravitational aether densities within matter to keep the whole process going; that is, aether flowing inward and thermal energy dissipating back out into free space to subsequently be reduced to vacuum energy. As such, gravity also becomes another source of heat keeping the earth and other bodies from going stone cold.

When electric charges are stationary and electric fields are static there are no associated magnetic fields. But when electric charges are in motion and the electric field is in motion, it results in a magnetic field. It seems reasonable, that a magnetic field is essentially the flow of electric aether particles moving around the moving charges; sort of like when an object moves through water, the water flows around the object and subsequently reforms behind the object, albeit, the three-dimensional aether flow associated with moving and rotating charges would be much more complicated.

VELOCITY OF LIGHT

According to the theory of special relativity, based in part on the results of the Michelson-Morley experiment, the velocity of light is constant within a vacuum. Since high frequency radio waves arrive somewhat before lower frequency radio waves after leaving the same source and while traversing essentially the same vacuum of space, it appears that radio waves, and perhaps light waves, do not always travel at, exactly, the same velocity through the vacuum of space.

Therefore, it is apparent that the aether of space likely affects the velocity of light, in addition to adding or subtracting energy from photons passing through the gravitational maze of the vacuum of space.

When light passes through transparent matter, it slows down, therefore, something that occurs at the quantum level affects light speed. When light impacts a transparent surface at an angle, it is refracted at an angle, which is frequency dependent, as illustrated by a prism separating ordinary sunlight into a spectrum. It seems likely that one side of the aether wave of the light impacts the surface before the other side, causing the light wave to bend. But what causes the light to slow down? In a vacuum, there are no nuclei and electrons to separate the two electromagnetic components of the aether, but within a transparent medium, the nuclei and electrons do affect the aether; probably by altering the effective density of the aether components between the nuclei and the electrons. If so, then the speed of light could well depend on the density of the aether.

As aether spherically converges into matter and, thereby speeds up, its density reduces and time slows and probably the speed of light slows, as well, while becoming bluer. Going upwards in gravity, the light likely speeds up while becoming redder. As photons gain or lose energy in gravity, that energy comes and goes from somewhere. Either the energy goes into or out of the velocities of the photons or it is deposited or withdrawn from the aether wave energy, which are likely to be basically the same thing.

A measurement of the velocity of light in free space should always result in the same measured velocity, even though the velocity of light varies with aether densities. That is because, the apparatus that measures the speed of light would be altered, as well as the velocity of light, in the same manner as would be clocks measuring time.

Gravity is known to bend light. Put another way, the gravitational driven aether flow applies a drag on the light, thereby altering its direction of travel. So light is affected by gravity but by a different mechanism than that of matter. If aether were to flow through a spaceship traveling at relativistic velocities, then light within the spaceship would most likely bend with the aether flowing through the inside of the spaceship.

ENERGY

Well known phenomena include: time moves faster at higher elevations in a gravity field and photons moving upward in gravity field lose energy becoming redder and, conversely, become bluer when moving downward. It is reasonable to consider that the photon energy gains and loses within a gravity field correspond to increases and decreases in the velocity of the photon, that is, the energy, at least in part, goes into and out of the velocity. Also, when light moves upward, it also moves into aether of a higher density, so it is likely that the velocity of light is dependent on aether density. Since aether densities would be the greatest in deep space, the velocity of light in deep space could be considerable faster than that measured here on earth; albeit, a measurement at any vacuum location would still result in the same vacuum velocity because the measuring apparatus would be likewise affected.

As a spherically converging aether accelerates through matter, it either draws energy from matter or causes matter to move along with the converging aether flow, thereby, gaining kinetic energy, or some of both. Matter moving upward or downward in a gravity field, correspondingly loses and gains kinetic energy. At the same time, the speed of time measurement increases and decreases. It is reasonable that the kinetic energy translates into or out of matter internal energy. That is, as matter rises in a gravity field, time speeds up and the reduction in kinetic energy goes into speeding up the quantum processes of matter, such as electron orbiting velocities. Conversely, when matter drops in a gravity field, time slows and the internal energy of the matter becomes kinetic energy. Thus, potential energy is essentially the internal energy. This process of transferring the internal energy of matter, into and out of matter, is essentially the property of mass.

As aether gravitationally speeds up while flowing deeper into matter that is fixed in place, time slows with depth, i.e., all internal processes slow. The internal energy reductions associated with time slowing goes somewhere. That energy likely agitates nuclei, resulting in the formation of photons, resulting in thermal energy, that subsequently, dissipates outward completing the cycle. In a non-converging aether, that is, free space, accelerating matter gains kinetic energy while the aether draws out the internal energy from the accelerating matter; reflected as time slowing within the matter.

The two-component aether passing through matter, somehow, affects the aether coupling particle exchange between nuclei and electrons, thereby affecting time related processes; the faster the aether flow, the slower the time related processes. These processes would likely include the electron orbiting time, either, by slowing electron velocities, or by, increasing electron orbit radius. If mass increases with an increase with aether velocity, then perhaps, the physical size expands due to an increase in orbit radius, thereby, increasing the cross section of the aether flow through matter.

Vacuum energy or aether energy likely consists of wavelike vibrations amongst the aether particles or aether particles simply oscillating. This energy when passing through matter may share the vibrations with the matter, thereby, exciting nuclei. When flowing aether gravitationally accelerates in space without matter, perhaps, the energy associated with acceleration comes from aether wave dampening.

Aether wave behavior is likely responsible for some right and left-handed behavior. For example, when an event results in the spawning two photons in opposite directions with opposite spins. This event coordinates with an aether wave rotating in the same rotational direction for both photons moving in opposite directions. Thus, one photon must spin right-handed and the other left-handed upon departure from the point of origin and would continue in this manner until some other event impacts a photon. If the aether wave rotation persisted for a time, perhaps it could help explain quantum entanglement phenomenon.

STRONG NUCLEAR FORCE

If a two-component aether field exchanges coupling particles between negative and positive charges creating electric fields, then it seems reasonable, that the conversions from one type of particles to the opposite type of particle directly involves quarks including those composing protons and electrons, as well as, free quarks. The constant flow of aether particles into protons and electrons may well be related to the strong nuclear force. Aether flowing into matter likely carries some wave type of energy, or vacuum energy, into the matter resulting in nuclear vibrations that subsequently results in thermal energy.

Physics notes that quarks are associated with one of three color charges, designated as red, green, and blue. Although color is just a name and has nothing to do with their behavior, these are three separate somethings. Are there three separate positive quarks and three separate negative quarks or are there three separate attachments to the two types of quark electrical charges? Consider that there are three separate color charges or coupling particles, operating relatively independent of the quarks, in a manner, like the game of rock-paper-scissors. That is, each color has dominance over another color, but is subordinate to the third color, and in certain conditions, the three-color particles form a kind of three-way circle. Now consider the electromagnetic coupling particle exchange between two electrical charged plates, where one charged plate disassembles a particle and the other charged plate reassembles the particle. Now consider that the electrical coupling particle in question is a three-way color charge circle and assume the negative electrical charge plate disassembles the color circle, while the positive plate reassembles the color circle again.

Aether waves provide a source of energy and if sufficient energy coexists with the presence of the color particles, the color particles can interact with quarks and act as a sort glue combining the quarks into protons and electrons, as well as, photons. The aether waves cause the spinning effect which somehow results in the color particles binding quarks together. A reason for assuming the positive quarks reassembles the color particles is the increased likelihood of combining two color particles to form a $2/3$ -charged positive quark, over the likelihood of forming a $2/3$ -negative quark. This difference would result in the preference of forming matter rather than anti-matter.

Now when sufficient energy is available to combine two $2/3$ -positive quarks together, it results in the problem that one of the three colors would be duplicated; which stability considerations apparently does not allow. Now consider that a photon consisting one positive quark and one negative quark bound together using identical colored charges, that is, same charge particles colors do not conflict if these color particles are attached to opposite charges. Now when the two $2/3$ -positive quarks combine with a $1/3$ -negative quark, the color charge associated with the negative quark cancels out one of the extra positive quark color charges resulting in a proton.

If electrons have three $1/3$ -negative quarks, the structure would likely resemble a rotating disk. A likely configuration would have it rotating around the axis of the disk with the axis aligned with the magnetic field lines. To give a proton a stable structure, consider the positive quarks rotating about an axis with the negative quark aligned with the axis. Perhaps the formation of the

electron would be tighter or smaller than the proton formation; hence the proton offers a larger cross-sectional area to the aether flow, and is, therefore, more massive than an electron. The quantum behavior leading to discrete units of spin, such as $\frac{1}{2}$ spins, is likely related to some discrete wave property of the aether.

It has been determined that the strong force gets stronger as a quark is pulled further outward. Perhaps, when a quark is pulled outward, a free quark from the aether stream simply drops into the vacated location and the further the quark is removed from its stable location, the easier it is for the replacement to happen. So, maybe it just appears that the strong force gets stronger.

WEAK FORCE

These discussions do not directly lead to a concept of a weak force associated with radioactive decay. Rather, it appears that radioactive decay is better described as a probability event where an unstable matter particle traveling through the multicomponent aether is impacted by an aether particle directly enough to knock off a piece of the unstable matter particle. The more unstable the matter particle, the easier it is to knock off a piece. Such events are probabilistic in nature, leading to the concept of a half-life.

The basic principles associated with quantum mechanical behavior need to be based on the behaviors of stable matter. Unstable particles only exist when generated by some energy event strong enough to temporarily fuse additional aether particles, such as, quarks or color charges to a stable particle, which lasts until another particle knocks off the extra pieces. In general, the more massive the unstable particle, the shorter the life span. How can the key properties of all the stable matter in the universe, such as mass, be governed by massive unstable particles, such as, a Higgs boson with such extremely short life spans?

Some unstable particles have additional quarks attached, whereas others, such as a muon do not. A muon decay results in an electron and neutrinos. So perhaps, a muon is essentially an electron with an extra color charge or two, resulting in the three negative quarks spread out a little further than those of an ordinary electron, resulting in a greater cross-sectional area to the aether flow, resulting in a greater mass. Further, this suggests that a neutrino is simply aether wave energy propagating through the two-component aether, carrying a color charge particle along with the wave; akin to a wave carrying a photon. Further what happens to all the neutrinos entering deep space from all those stars in all those galaxies? Why is the universe not filled completely up with neutrinos? Likely, the neutrinos simply lose energy, via vacuum friction, until gone.

CANDIDATE AETHER MODEL

An understanding of the composition of the aether must rely on the application of logic to available observations of physics. The following speculative ideas may offer a starting point.

The aether consists primarily of singular unbound quarks, both $\frac{1}{3}$ -positive quarks and $\frac{1}{3}$ -negative quarks, in relatively equal amounts. In addition, there is a coupling particle consisting

of three sub-particles that communicates between these two types of quarks. When the coupling particle interacts with a negative quark, it is decomposed into three uniquely different sub-particles, previously named for colors. The decomposition could happen all at once, or in a two-step process, where only one color is removed at a time. Positive quarks subsequently recombine these three-color sub-particles forming three-way circular particles, subsequently, pushed back towards the negative quarks. The recombination process could also happen in a two-step process. As such, these sub-particles could exist singularly of one of the three colors or the particles could consist as combinations of two colors.

Both matter and photons are composed of quarks bound together by the coupling particle or some combination of the coupling sub-particles. A sub-particle would attach itself to quark and then sub-particles of different colors could combine two quarks, such as, forming a $2/3$ -positive quark. Conversely, forming a $2/3$ -negative quark is less likely, because the negative quarks perform the decomposition process; hence the preference in forming matter rather than anti-matter. Three negative quarks of different attached color charges, along with sufficient energy, could then form an electron. Conversely, three positive quarks of different attached color charges, along with sufficient energy, could then form a positron. A photon would consist of one positive quark and one negative quark tightly bound together, likely using identical color charges, that is, same particles colors do not conflict if these color particles are attached to opposite electrical charges. The binding strength of a photon would be stronger and use less energy than those of the electron and positron; hence when an electron and a positron come in contact, the result is energetic photons.

The gravitational process involves the flow of aether, consisting of quarks and coupling particles, into matter. The aether flow carries vacuum energy along in the form of waves or particle oscillations. Inside matter, aether waves would agitate nuclei and electrons and when sufficient agitation energy was available, quarks could combine forming thermal photons. This reduction in the component quarks and coupling particles provides the motivation drawing the aether into matter. The accumulating thermal energy would gradually dissipate outward from the matter into space. Whereafter, thermal photons transiting space slowly lose energy, via vacuum friction, until the photons disassemble into aether components with the thermal energy gradually becoming vacuum energy forming a continual cycle.

For aether to flow into matter, it must converge. This converging flow must accelerate as it is continually flowing through a smaller and smaller spherical area. As the aether accelerates, the flow velocity increases and time slows down, as represented by all the localized physical processes used by clocks to measure the passage of time. The faster the aether flows through matter, the slower time passes.

As the aether flows between nuclei and their orbiting electrons, the electromagnetic fields of the atoms cause a separation of the positive and negative quarks of the flowing aether, resulting in a weakening of the atomic electromagnetic fields; thereby causing the electrons to orbit a bit further away from the nuclei. This phenomenon controls all associated time-related processes, and the faster the aether flow, the slower time passes. If the aether flow is accelerating, the

aether particles carry away some of the material internal energy. If the aether flow is constant, then the aether gains and subsequently returns the associated material energy.

The acceleration of aether passing through matter gives matter its property of mass. As the aether accelerates and flows increasing faster, all the physical processes, represented as time, slows down and the associated energy is drawn from matter into the aether. This energy transfer process is essentially the property of mass. Further, this transfer process is essentially the same for matter accelerated by an external force, as well as, gravitationally accelerated aether as it converges into matter. As matter speeds up or slows down, for example, within a gravitational field, the internal energy transfer between the matter and the aether corresponds to the increases and decreases in the kinetic energy of the matter. As such, the internal energy associated with time slowing or speeding is essentially represented as potential energy.

This energy transfer process is further represented by the size of the matter particles, such as protons and electrons. The cross-sectional area of the matter particle to the aether flow affects the aether flow amongst the quarks that form the particle. A proton is larger than an electron; hence more aether flow amongst the proton quarks; hence the proton is more massive than the electron. However, the photon configuration of one positive quark and one negative quark is so tightly bound together that no other aether particles can pass between the two quarks; hence a photon has no mass. As the flow velocity of aether through matter increases and time slows, resulting in an increase in physical size with an increase in the cross-sectional area presented to the aether flow, the matter increases in mass.

The gravitational force on a material object is caused by the accelerating aether flow passing through the object. The accelerating flow causes a gravitational time differential across the depth of the object. Therefore, the physical processes on the upper elements of the object move more rapidly than the corresponding processes on the lower elements, including those associated with the orbiting electrons; whereby the faster moving electrons of the upper elements of the object puts a pressure on the slower moving electrons of the lower elements. This downward pressure is the force of gravity.

The flow parameters of aether flowing through matter include the aether particle density, the flow velocity, and the flow acceleration. The aether density would be highest out in deep space and lowest deep inside large masses, such as a black hole. Therefore, the aether density within the earth will be somewhere between the density in deep space and the aether density in the sun. The flow velocity and the flow acceleration of the aether is determined by the gradient in the aether density, which will vary with the mass of the gravity well. The flow velocity affects the rate of physical processes, reflected in measurement of time, and the acceleration of the aether creates a drag force, either inertial or gravitational.

The effect of time change may also depend on the density of aether, as well as, the flow velocity. Logic indicates that light speed changes as time changes, but logic also indicates that aether wave velocities is density dependent, as well. The measurement of the gravitational constant, G , is also dependent upon aether density, therefore G is not a universal constant. A similar measurement in inter-galactic space would result in a much larger value for G , that is, the much

higher aether density of deep space has a much larger gravitational effect and this larger gravitational force holds the galaxies together, without postulating another fictional mass.

Electromagnetism is the process where the positive and the negative quarks of the aether become separated creating flows of the coupling particles back and forth between the two types of charges; intact particles flow in one direction and the decomposed pieces flow in the other. This charge separation is an electric field, when static, along with a magnetic field, when dynamic. Dynamic charge separation includes wave like behavior. The electric fields and associated wave behavior would constitute energy.

In this model, there are three types of waves moving through the aether all moving at light speed. There would be two types of waves involving a separation in the two-component aether; that is, positive versus negative free quarks. The first type of wave would involve the passage of photons, where energy was both imparted to the fields and simultaneously recovered from the fields; the rate of which would likely govern light speed. The second type of wave would also involve wave separation waves, but without involving photons, where the wave would propagate until the wave interacts with something else, or slowly dissipates. A third type of wave would involve the entire two-component aether waving in unison without component separation, and so, would not be electromagnetic in nature, but would be gravity waves; also traveling at light speed.

Some aether waves could fan out in all directions, slowly dissipating with distance. Gravity waves would be of this type and so would some electromagnetic waves. Photons would travel through the aether as a particle with the photon spinning, the wave would have a sort corkscrew like structure. While light fans out in all directions it would consist of discrete separate drill holes through the aether. Entangled photons moving in opposite direction and opposite spins could leave a temporary connected wave path such that a change in one photon could be reflected along that pathway, thereby, affecting the other photon.

Smaller waves could combine to form larger waves when wave peaks coincide, in a manner like rouge waves in the ocean, and the larger waves could contain sufficient localized energy along with the coupling particles to bind a positive quark and a negative quark together resulting in the formation of a photon, or possibly, even spawning an electron-positron pair. Aether waves provide a source of energy and if sufficient energy coexists with the presence of the color particles and quarks, the color particles can interact with quarks and act as a sort glue combining the quarks into protons and electrons, as well as photons. The aether waves cause the spinning effect which somehow results in the color particles binding quarks together.

There are three types of neutrinos and there are three types of color charges associated with the strong force, and there are three levels of leptons in the standard model; suggesting a possible connection. The tau and muon leptons both decays down to an electron after giving off or receiving neutrinos. Proposing that all three leptons, tau, muon, and electron, consist of three $1/3$ -negative quarks but with different color charge compositions making up their strong nuclear forces; with the electron strong force being the strongest resulting in a stable particle. Further, the stronger the nuclear force, the tighter the three quarks are bound together and the tighter

bound the particle, the smaller the mass, because it presents a smaller cross-sectional area to an accelerating aether flow passing amongst the quarks.

Now consider that the strong forces of these particles consist of combinations of color charges and consider that neutrinos are some combination of color charge particles traveling at or near light speed through the aether with an energy corresponding to the aether wave energy. Neutrino oscillations could be the result of the neutrino color charge particle interacting, while enroute, with other free color charge particles within the aether, thereby changing its color composition, resulting in a different type of neutrino.

FINAL NOTE

This paper presents another concept for quantum gravity; that is, aether flowing into matter; one that has a reasonable chance of being correct. It was presented more from an engineering viewpoint than from a physicist viewpoint. Certainly, there is room for new ideas which can stimulate more ideas. There is an old saying that: "Hell hath no fury like an unjustified assumption," and this viewpoint points to unjustified assumptions. Unjustified assumptions can cause physics to go wrong and bad assumptions can cascade into other bad assumptions. All well understood physics must make sense.

Two ideas were suggested for experiments that certainly can be performed. The Michelson-Morley experiment can be performed with the interferometer oriented vertically so that it is in line with the downward flowing gravity vector; and able to rotate on an axis. If the aether flows into the earth and light is affected by the aether, the experiment may detect the aether as was the initial expectation of the Michelson-Morley experiment, whereas laying the interferometer flat with respect to gravity, it did not. However, the interferometer needs to be designed for the velocity of the aether. The Michelson-Morley experiment was designed to detect an aether flowing at the velocity of the earth rotating around the sun. If an aether exists that flows vertically downward into the earth, its velocity is an unknown. A positive result would verify the idea that aether flows into matter. A second experiment would again measure the gravitational constant at a location where previous measurements varied with time, but this time, take sufficient measurements to correlate the measurements with the position of the moon. If such a correlation should exist, it would support the idea that the gravitational constant is affected by the aether flow and is not a universal constant.

Mathematics is a tool, not physics. First the physics must be understood and then math is used to describe it, and then math can be used to make predictions. However, not all solutions to mathematical equations represent reality. Further, using mathematics that represents known physical reality to make predictions beyond the known is risky, and the further beyond the known, the greater the risk.

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