FIELD STRUCTURE THEORY (FST)

Postulating the natural world as a product of fieldstructure geometry

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An independent research project
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In an explanation of fieldstructures, the discussion begins with the concept of *action*, the simplest notion we have about anything. Action has been defined in many ways. In this paper, actions are loops of relatedness. Action manifests in the physical world as energy when it acquires a wave form. The business of fieldstructures is to show how action converts into energy and energy into mass (and vice versa). FST (Field Structure Theory) begins with a matrix of action, the apparatus from which energy is manifest. FST is a background dependant theory.

In FST, the necessity of a closed line of action (a loop) became apparent since it was the only form found that could evolve structural complexity without having to introduce contrived devices such as fasteners. Fieldstructures use only one building element, the loop to create fields of structure. A line of action that does not close, the open string with two ends, was studied and found incapable of structural potential.

FST visualizes loops of action forming a matrix, an action plenum, and then interacting these units of action to produce radiant boson energy waves. From the radiant boson energy structures, fermion structures evolved. Fermions are energy structures that occupy a local space having limited dimensions and a rest state. Structures with a limited spatial extension are considered mass particles. The two fermions responsible for the longevity of the universe are the electron and proton. They are the only particles whose mass can have a stable rest state. Contrary to the decrees of the patent office, these two structures are perpetual motion machines *par excellence*.

Fieldstructures allow us to build a fractal continuum with a single structural unit, the loops of action. The building sequence goes from action to energy to mass simply by changing the number of action loops involved, the number of twist there are in each loop and their structural orientation to each other (chiral spin). Matter and the action plenum are related the same way a knot and string are related. Which is to say the material world is not separate from the action matrix.

The key word for understanding structure and physical reality is FIELD. The field is not a contrived background invented to track the trajectory of moving objects. In FST it is not thought of, nor does it function as a background on which matter and energy play. A field fully functions in the affairs of matter and energy, as a string and knot are

inseparables. Matter is a form the action plenum takes to localize energy to create a force field. **In order to produce a world of energy and mass, there are two essentials: (1) a circuit of action (an action loop) and (2) the rules for how the circuits of action relate to one another.**

The action plenum is the womb from which both radiant and localized energy arises. Like all mothers at all levels of structure, the plenum knows how to draw upon her resources to produce form. Once inspired to produce, the action plenum weaves together to form radiant energy. It is with the chiral weaves of radiant energy that mass can be formed. How the action loops are structured determines whether the action will be expanding radiantly or stabilized locally. These complexes of action loops establish circuits of action that synergetically connect to other compatible circuits of action to build hierarchies of form wherein higher complexity can be achieved without loosing the structural connectivity to the contributing action forms.

Energy can build matter and vice versa, and this can be practically demonstrated in buildable structures, as will be shown as this paper develops. These same fieldstructure building patterns are found in nature. The ability to go from a concept of action to a working structural model of energy and mass is unique to fieldstructures.

Energy in the form of loops of interacting action can morph from matter to energy states by adding loops of action to a circuit of action or by rotations of the line of action that forms the loop(s). The opposite process is true as well. It is the rotation of line of action that occurs when action loops are added to a fieldstructure that alters the flow of energy and changes the form.

In this way, action can be made to flow in multiple dimensions. Our so-called three-dimensional world is actually the results of three other dimensions that are rolled up inside the three x, y, z dimensions that are rolled up in visible x, y, z dimensions. In other words, each axis has within it three other axies plus time, and those three axies in turn have three more x, y, z axies plus time.

Said a bit differently, to account for the x, y, z dimensions of our world experience, we need to include the z, y, z axies of two other contributing x, y, z dimensions plus time. To produce a world that looks to us as three-dimensional, actions of a simpler contributory dimension are utilized. In the three-dimensional universe, we cannot see the curled up dimensions because they are wrapped inside the action events that we do perceive. We are “seeing” the last three dimensions of a hierarchy of nine dimensions plus time. The reason this hierarchy of dimensions exist is that each lesser dimension skews the geometry of the higher dimensions it creates so that lines (of action) do not intersect.

As stated previously, action interacts to produce particle boson energy having locality. Boson particle structures interact to form the two-fermion particles, the electron and proton that have a rest state and endure in time as stand-alone stable masses. The idea of bosons building fermions has been observed in the laboratory. The overriding duty of structural

physics is to show how stable particles (e^- and p^+) along with the energy particles, (photons), produce a universe. The transition particles, while not having a lasting effect on the life of the universe, are useful in that they reveal the internal structure of the stable particles, which we are about to discover hide inside stable matter. The problem has been our senses and sense enhancing machinery only see outer appearances.

FST proposes that fieldstructures that have been built and photographed for this paper exhibit the same structural principles at our scale of experience, as they do at all other scales of structure. Beginning with the plenum, action is formed into particles, particles into atoms, atoms into molecules, molecules into cells, cells into organisms and so on. Aggregates of these micro scale structures use the same structural continuum as do solar, galactic and the universe itself. **It is a firm conviction of FST that unless a structural system is an all-encompassing fractal continuum through all scales of physical experience, it will not be the operating system of this universe.**

Fieldstructures (FS) utilize a skew polyhedral geometry, whose axioms are:

(**1) Lines are loops.** Lines don't end.
(2) Lines have dimension. Lines are not infinitesimally small moving points.
(3) Lines interact. Lines do not intersect.

As far as I know, these axioms differentiate it from other geometries.

If a FS (fieldstructure) is built that does not have integrity, it has the decency to fall apart and get rid of itself voluntarily. You cannot fake a fieldstructure. They are self-proofing. They either work (sustain themselves in time) or they fall back into simpler form that *will* sustain in time, radiating away the unnecessary energy.

Fieldstructures are all about how a line/loop of action twists, braids, links and knots in three-dimensional space. When loops of action interact about a common axis, waves develop on the loop whose frequency is the number of full twists of the line of action. In the three-dimensions, fermion frequency is determined by a polyhedron that arises from the interaction of the action loops of contributing particles (quark), i.e., fieldstructures. The appearance of the polyhedron created by the interacting loops of action is the key discovery made by FST. The polyhedral underpinnings of physical reality felt by Buckminster Fuller to be fact, is confirmed by FST to be the same architecture used by nature. Fieldstructures are accomplished by making the shift from classical Euclidian geometry based on intersect lines to skew geometry based on interacting lines.

The polyhedron that is produced when a Field Structure is built can be thought of as nature's way of instructing the action loop on how to bend so that the frequency had by the form can be sustained in time. The polyhedron created by the action event can be thought of as the operating principle; a plan for how the action is to circuit energy. The massiveness of matter is determined by the nuclear polyhedron (see Fig. 20). Each polyhedron will have a specific

number of loops and rotations (twists). The energy of a particle is a count of these loops (mass) and twists (wave frequency). In the case of the Platonic polyhedra, each loop will have identical frequencies. This paper will show how the action loops develop frequency modulations. All other polyhedra such as the Archimedean and irregular polyhedra will have their own unique composite frequencies. Matter differentiates itself by the rich range of frequency modulations that develop as complexes of action structures combine in multi-dimensional complexities of atom, molecules and cells.

After explaining how the hierarchy of action is structured, this paper will conclude with a **PARTICLE HIERARCHY CHART for the First Form Family (1st generation of particles)** seen on page 18 of this paper, **s**howing how Field Structures model particles and account for there known attributes. To the author's knowledge, this is the first plausible explanation for particle mass values. This chart is a scaffold with which science can now detail a complete explanation. In an effort to keep this paper as short as possible, the presentation is designed to wet the reader's interest in finding out more. Hopefully enough material will be presented to spark interest in the Field Structure concept.

Action Circuits

In FST, action does not intersect. It is intersections that produce the dreaded infinities that have plagued physics. In my humble opinion, the fact that physics has for so long regarded particles as points has precluded it from discovering the structure of nature. The use of ***points of intersection*** instead of ***places of interaction*** has befuddled our thinking about everything, all the way down to how we view the world. I would further comment that spaceless and timeless anything couldn't make a space and time universe. How can nothing make something? Action is the interaction of two separate, and separated, entities that have formed a relationship wherein, as in the simplest expression seen in Fig. 1, B relates to a C and C relates to B reciprocally. FST agrees with *the loop quantum theorists* in proposing that at the fundamental level of relationship, action forms into loops, rather than being line segments with dangling ends. While looped action circuits are admittedly an assumption, the fact they generate the known attributes of the material and energetic world, as postulated by FST, strongly suggest they are a reality and hence useful abstractions, if not actual entities.

The very first concept we encounter in looking into the nature of action, and hence its most fundamental attribute is that a circuit of action is either a clockwise (Cw) or counter-clockwise (Ccw) motion. The mere making of a loop, suggest chirality is going to be a fundamental property. These looped action circuits in our universe begin a hierarchy of structure that is thirty-three powers smaller than one centimeter (10^{-33}). These tiny loops of action are believed in FST to totally pervade our universe as a linked matrix. In FST, this matrix is termed an *absolute action matrix* (AAM), or *instantaneous action plenum (IAC)*, simply *the plenum.* The word 'absolute' is used to indicate this matrix is not

understandable in relativistic time/space terms. Other names, such as ether, aether, Akasha, prakriti, chi, etc., have been used for this matrix. From here on, this paper will use the term action plenum, action matrix, or just plenum to refer to realities material and energetic underpinnings.

The cause and effect sequence of relative experience do not apply to the action plenum; such realities are produced from it. If energy and mass are knots, and create a relative world, then the action plenum is the string upon which the knots of mass/energy are tied. All parts of a string are string, whereas only that part of a string that is knotted can be said to be a knot, although it is possible to make a knot to spread out over the entire length of the string loop (Fig. 1).

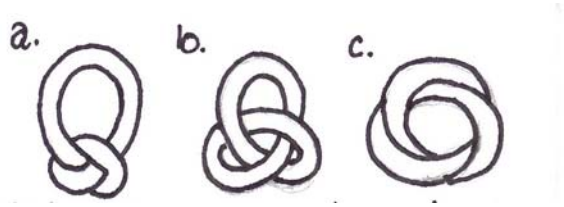

Fig. 1: (a), Closed knot – the particle (b), Loose knot – the particle/wave (c) Open knot – the wave

A useful analogy is to think of matter as a knot, while the string is the action plenum. You can have a string without knots, but you cannot have a knot without a string, just as there can be an action plenum without mass but there cannot be a mass without an action plenum. This may seem too obvious to mention, but it has far reaching ramifications. It is at the heart of the wave/particle paradox. The loops of the action plenum energizes by forming waves. How this is done is another key to understanding physical reality. All forms of matter and energy have frequency. The equation for energy is $E=hf$, where energy equals Planck's constant times frequency. When a loop of action interacts, either with itself, or other loops energy is arises because this form can do work, it carries momentum and force. In FST, the presence of a wave means that there is a three-dimensional (actually a nine dimensional plus time) interaction of action.

Note: *In FST, a circuit is a closed line of action that forms a continuum of action. A circuit can have multiple loops. A loop is a 360˚ rotation of a line of action. For instance, a circuit with 10 loops has 10 rotations, which is 3600˚degrees of twist/rotation. A loop is one unit (quantum) of energy. Counting loops is a factor in determining the energy of a fieldstructure. Counting the number of twists in a loop is the other method of determining energy. Both looping and twisting have to be considered as indicated by* $E = mc^2$ *indicate, the twisting being the expression of the twisting while the mass is a looping issue.*

A full twist of a line of action (loop), about its axis, also counts as a rotation and as a quantum of energy. Bending a line of action into a loop is a rotation. Twisting the line of action about its axis is also a rotation. These two ways of rotating a line of action are important as they both count toward the total energy of a quantum system. Looping is a fermion's way of adding energy, while twisting is how a boson adds energy. When a fieldstructure model is examined these two ways of adding energy will become empirically clear.

A quantum does not have a specific amount of energy other than a one-unit minimum (no fractional quantum units because a loop is a loop, there are not half loops). As far as we know, a quantum of light can have any amount of energy, meaning it's line of action can be twisted possibly any number of times. If there were a limit then the light spectrum would have limits. The number of twists in the action loop determines the energy of a quantum. Regardless of the frequency of the quantum unit, it's a unit because no matter how many twists in the unit, the Planck length of the line does not change. What will happen, however, is that the spatial extension of the loop contacts as the number of twists increase. In the equation E = *h*f, Planck's constant (*h*) refers to the ratio of the energy to its frequency (*f*). Since the line of action is fixed spatially by *h*, adding energy to a quantum decreases its spatial extension. Adding energy to a fieldstructure does not increase its action domain volumetrically. Rather it decreases it, so that the relation of the spatial extension is kept within a given relation to the time the energy has available to it to complete it circuitry. Each platform of matter (particle, atom, molecule) has its own special time/space relation as determined by $E = mc^2$.

In Fig.3, the energy is an expression of the domain in which the event is occurring. The number of twists is determining the frequency. The frequency always has a specific ratio to the loop. At the level of the action plenum, a single full rotation of the line of action is Planck's length.

A quantum of light can have an enormous range of energy ranging from a low-frequency radio wave to a high-frequency gamma wave. When chiral opposite action circuits interact, they form into waves (see Fig. 3). These circuits develop frequencies that determine the intensity of the interaction (energy). The energy of the system is determined by the frequency times Planck's constant. At the quantum level, the more energetic the event, the smaller is its domain because more twist is being cranked into the line of action. Gamma waves are generated by nucleons and inversely gamma waves generate nucleons, which are known physical processes. X-rays originate from the electron proper, from its internal structure. While no fermion particle fragments are known for the electron, by colliding an electron with its anti-self, the positron, right and left-handed gamma rays are the sole products of the interaction. This indicates that the electron's internal structure is composed of intensely confined boson photon energy. In nature the all matter is reducible to light. When physics says there is no internal structure to a particle like the electron, it is failing to consider light as being that internal structure.

The electron field as opposed to the internal field of the electron particle discussed in the proceeding paragraph, decays by producing microwaves, light waves and radio waves. The larger the field of the generating mass, for instance, an electron field vs. a nucleon field, the less energetic the wave frequency. The looped action circuits interact in specific ways that depend the energy in the field. There is a connection between the spatial domain of the field and the frequency.

At the most fundamental level, that of the action plenum, an action loop has minimal energy. To make a loop requires bending, and that requires energy. So the action plenum has a minimum amount of energy, often called its vacuum energy. To form mass, the action plenum has to be deformed yet again by either bending and/or twisting the action plenum. This produces measurable energy into the plenum. This energy is gravity. Take the mass away by decaying it back to light and gravity disappears. Fieldstructures show how this deformation to the action plenum produces boson particle/wave, which after further deformation to the plenum produces mass. Should this deformation produce a loop and should the loops then interact in a specific way, a stabilized mass will result. When these requirements are met, a fieldstructures is produced. The interacting loops of action when twisted into fieldstructures are able to be stand-alone as stable three-dimensional structures.

If there is a connection of the physical world to the action plenum, modeling the action plenum is essential. Without an idea of its structure, physical reality cannot be derived. Ascertaining this structure with the mathematical tools how employed has failed to determine this structure. FST approaches the problem with a different tool, the tool of skew geometry and the fieldstructure model.

When the action plenum has no mass, it would be in a state of homeostasis, complete entropy. However, by postulating a multi-dimensional world for reasons previously mention, there is a slight twist in the plenum. That twist causes each dimension to have a spatial dimension. In our universe that dimension is Planck's length ($1.616\,24 \times 10^{-35}$ m). and forces us to include Planck's constant in all energy equations. The slight twist in the action plenum gives a skew to all moving objects through space/time in the form of intrinsic spin. Planck' length, forces each unit of action in the action plenum to be minimally bent so that it complies with the skew geometry axiom that no two lines (of action) intersect. It forces precession orbits.

To understand energy, we need to understand why waves wave?

We know that to understand energy, a wave has to be described, because we have found the root equation for energy involves frequency ($E=hf$), but what is it that we are describing? The particle description, which is another way of describing energy, fails to describe the structural wave dynamic of energy. With particles, science deals with energy through differential equations where the motions of objects (point particles) are observed in time/space. These equations tell us everything about motion and/or position of a particle, but nothing about how or why they have the values they have, nor the fundamental nature of the particles.

Waves are dealt with as frequency times the action constant (Planck's constant).

http://en.wikipedia.org/wiki/Planck's_constant: *The action constant (Planck constant) has the dimensions of energy multiplied by time, which are also the dimensions of action. In SI units, the Planck constant is expressed in joule-seconds. The dimensions may also be written as momentum times distance (N·m·s), which are also the dimensions of*

*angular momentum. The **Planck constant** (denoted **h**) is a physical constant that is used to describe the sizes of quanta.*

FST concludes that action becomes energy when the action plenum forms waves. This is accomplished when two chirally opposed circuits of action inhabit the same domain. When you put two identical mirror image loops of action together into the same domain and insist at the same time that the length of the two lines of action not change, each loop has no alternative other than to twist around each other and share a common axis. (Fig.3) The resultant is that each forms a helical wave where the axis of rotation is the same for both. The axis shifts from the inside of the loop to the outside of loop. That axis is the where the two helical chirally opposite loops share a common boundary. The results are that all forms of boson energy come in two forms simultaneously, a right and left handed form.

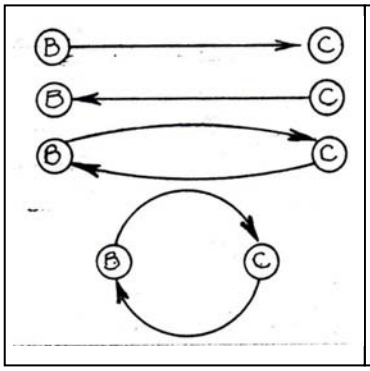

Fig.2: Relationship establishes the notion of action and forms a closed loop that transforms from an oscillation to a rotation. Polarity begins at this fundamental level.

Nature agrees and allows two chiral electrons rotating in opposite directions to occupy the same atomic shell. While the internal spin of the electron remains chirally the same, the handedness of the electrons orbit can be either cw or ccw (clockwise/counter-clockwise). Action loops demonstrate how this is done and why we need to consider that there are two chiral loops involved in a wave of any kind. By twisting together, a linkage is formed as seen in Fig. 3. This suggest that right from the beginning, where notions of form are as elementary as they can be, there are two motions that contribute to the formation of a wave, one clockwise (cw) and one counter-clockwise (ccw). To be complete, action is a 720˚ event involving a 360˚ cw and 360˚ ccw rotation. As we shall see, the decision to go cw or ccw is rudimentary and shapes reality.

But what if we only see, or seem to see, that the world is generated from one or the other of these motions but not both? Suppose the world we call 'real', which is derived from ccw motion of the electron and the cw motion of the proton, prevented us from seeing their counterpart particles, the positron and anti-proton? Recalling that molecules are produced by valance electrons linking together atoms, it seem in keeping that the ccw rotation is going to be the predominate

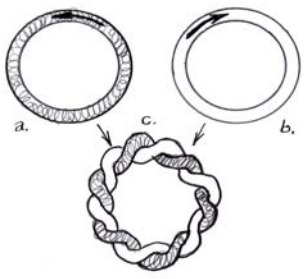

Fig. 3: A linkage of cw and ccw loops occupying the same spatial domain without interference. This twisted form will not untwist. It holds its shape naturally.

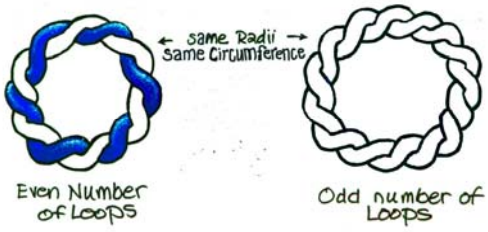

Fig. 4: The Law of even/odd frequencies:
An even number of nodes needs two loops.
An odd number of nodes have one loop.
Energy has an even number of frequencies.
Mass has an odd number of frequencies.

handedness of the world we work with. Given our corporal sensorium is a product of electron interactions, it is no wonder the ccw preference is everywhere abundant and the cw preference that would result from structures made with positrons are nowhere to be seen. What if we only see the world that is derived from the ccw action loop? That would mean there is another world of cw motion action loops that we cannot see with our ccw sensorium. We may know it is there intellectually, but we can't see it. That world would then be an anti-world filled with anti-matter and as we have show in Fig. 3, it may be that the anti-matter world is fully integrated into our familiar real matter world. AND together each would be responsible for making loops of action form into waves AND still we would not "see" this anti-matter world. If we could see both worlds, we might come to know that the interaction between the real and anti-matter, the ccw and the cw motions of boson is producing our fermion universe, the obverse being true for the anti-universe. We would see that we have to have them both, not separated but integrated together structurally in order to account for the wave. If Fig. 3 bears any resemblance to reality, waves wave because real and anti action loops are interacting.

It should be noted however; a FST confirms this structurally, that while we can see cw and ccw boson light energy, we cannot see anti-fermion counterpart particles. At the fermion level, the chiral counterpart particles to real particles are cloaked from view by the real particles. If we accept this, then we have a way of accounting for the seeming absence of anti-matter from our universe. We can also account for the appearance out of what seems to be "nowhere" anti-particles in particle decay.

Physics has shown us that the only difference between a real particle and an anti-particle is in the handedness of their motions. We know that anti-matter exists because anti-matter has been produced when real matter is catastrophically destroyed in an accelerator. Interestingly, we fail to 'see' the anti-matter prior to the destruction. There is a reason for that. As previously mentioned, it is cloaked inside the real matter. Fieldstructures show how this cloaking is accomplished (Figs. 32 and 37).

Fieldstructures reveal that by including their presence, unseen thought it be, the bound energy values, less the decay particle values, account correctly for the know unbound energy values of particles. This method of accounting can be seen in the chart at the end of this article.

In nuclear decay, anti-matter is known to emerge from the decay of real matter! The obvious inference is that the anti-matter was there all along. We need to consider that just because we don't see anti-matter, it is nonetheless there and is structurally playing its part in producing a universe. In the accelerator where high-energy particles collide, the bond between the real and anti-particles are broken. Decay occurs when the ability of the colliding fermions to accommodate the energy is exceeded.

Boson energy particle behavior differs from fermion behavior in that we can *see* both the cw and ccw versions of light particles. A cw boson cannot hide a ccw boson the way a real

fermion can cloak its chiral opposite. While cw and ccw bosons can be seen, it is only in a fermion that cloaking occurs. This can be explained using fieldstructures. While proposing here that a fermion is in fact a dual structure of a both chiral particles in a symmetrical relationship, the fact is also that a FS can be built that self-sustain without having both chiral fermion partners present. A fermion FS can be made with or without its partner, whereas it takes both chiral partners of a boson to produce a boson particle structure. We find this restraint in nature and in fieldstructures. We find it possible to have a real fermion without apparently having its chiral counterpart on one hand while a boson always has it chiral counterpart present and accountable. The apparent paradox is eliminated if the hierarchy of boson and fermion particle structures is analyzed. It will then be seen how fermions are built from bosons and the correct number of circuits/loop are present to account for both chiral fermions while the real-matter fermion hides the curled up dimensions of its contributing chiral bosons.

A boson FS has to have both chiral loop/circuits present while fermions only need one chiral loop/circuit or the other, but not both. Since light is the decay of mass into energy, we always see cw and ccw light emitted together.

As it relates to the action plenum, electrical charge, electrical field and magnetic field issues, while chiral in nature, are fields that do not appear at the plenum level of primary action loops. While these field forces are stresses on the plenum, they are types of stress that are only induced by the presence of fermion masses. No field forces exist without the presence of mass. Mass fields occur when plenum loops build a spatial domain of sufficient energetic complexity.

With the emergence of chirality, the action plenum begins. It is here the world divides into real-matter and anti-matter. Both universes exist and both interact to produce each other. This is a new concept as far as I know in physics. Real and anti matter are not divorced from each other. To the contrary, they are matches made in heaven, soul-partners. We, as the product of real-matter, happen to be seeing only one half of the whole cosmic picture, the half we call real. It is only recently that science even knew there even exists an anti-universe. Interestingly, Vedic metaphysicians have been aware of this. To acknowledge their accomplishments, FST has used Sanskrit words from the Vedas to label some of its discoveries.

Light is visible to both the real and anti-boson worlds, but when light energy becomes entangled in a fermion mass, only the chiral circuitry of real-matter is visible. That has been our fundamental perceptual problem and has lead to our mistaken notion that anti-matter is somewhere else or non-existent in our real matter universe. It is right here, but we can’t ‘see’ it, nor can our real-matter instruments detect it, as long as it is entwined and cloaked by real-matter.

The important point is that it takes two loops spinning in opposite directions to create a wave. Reinterpreting the wave as the resultant of interacting opposite motions, solves a host of conceptual problems, not the

least of which is in understanding how opposite spinning waves can emerge from structures that do not seem to have anti-motion before the interaction took place, as for instance when anti-matter (the neutrino) emerges from a hydrogen fusion reaction.

A wave has energy which is expressed most fundamentally by the equation written as E = h*f* or alternatively as E = h*v, f* and *v* being interchangeable designations for frequency. Energy is frequency times Planck's constant. In terms of a FS, as the wave frequency increases, the loop adds frequency (nodes) to the action loop. Since Planck's constant is constant, to add frequency, (i.e., energy) of the action unit would seem to provoke one of two choices for a fundamental particle of action. (1) It can increase the length of the *line of action* (LOA), which is tantamount to changing the value of Planck's constant (*h)*, or (2) it can increase the energy of a quantum by twisting additional frequency into the line of action. Changing the value of Planck's constant as in case (1) would mean the value isn't constant and we know the value has remained unchanged for at least the last 100 years since its discovery. The unchanging Planck's length is a cornerstone of physics, but even if it did change everything would be changing proportionally so it is likely it would not be noticed. Changing *h* merely increases the volume of the event but does not induce a wave frequency change, which is to say a change in the qualitative value of its energy.

Physics tells us a unit of quanta does not get bigger volumetrically when it becomes more energetic. In fact, the more massive a particle the smaller its field of action becomes. Protons live in a much smaller world (field) than do electrons. Changing Planck's constant merely changes the calibration of the ruler with which we measure the universe. If adding energy to a quantum is not done volumetrically, then (2) the other way to increase energy of a quantum is to twist the line of action. This doesn't change the Planck length, but rather it enfolds the line of action into a smaller space as can be seen in Fig. 5. Inducing torsion (twist) to the line of action increases the frequency of wave without enlarging the volume of the action event. In fact, adding frequency initially diminish volumetric extension of the action event as the example given by the electron and proton above. We know the frequency of a proton because in example of proton/antiproton annihilation, the energy released is gamma frequency, while electron/positron decay is x-ray frequency. The event volume decreases the more energetic the particle, the smaller the field space it occupies. Protons with 99% of the mass of an atom live in a much smaller space than the electron. If an electron is energized (heated) to a frequency of a proton, the electron will morph into a proton, which means its energy will compact into a smaller spatial domain, a tighter knot configuration.

In FST, energy is added to a fermion mass particle by adding loops, while boson energy is added by twisting the loops.

In both cases, the frequency changes, however, boson frequency will change in the area of a fieldstructure that is called the *energy field,* while a change in the number of loops changes the frequency of the mass field. The interchangeability of twisting

and looping is equivalent to the interchangeability of energy (twisting) and mass (looping). While both are energy, boson energy and fermion energy potentials are very different, we will see later that twisting and looping amount to the same thing energetically although the two operations still distinguish boson/energy events from a fermion/mass event. In both cases, **energy accumulation occurs within a preset volume of the action field domain.**

The Action loop

To make a loop requires a line to be bent 360˚. In FST, a 360˚ bending of line of action is the equivalent of rotationally twisting a line of action 360˚. The same ness of bending and twisting is the FS reason for why mass and energy are interchangeable and interactive as suggested by $E=mc^2$. How fieldstructures (FSs) store energy is determined by whether or not the FS is a linkage or a knot. **Linkages twist to store energy. Knots loop to store energy**.

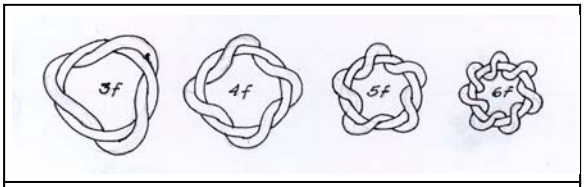

Fig. 5: Wave frequency diagram. This assumes the loop length does not change (Planck's constant is constant). By wrapping the line, the loop volume diminishes. **Adding energy to a loop of action** increases the frequency of the line of action and thereby contracting the spatial extension of the action loop. Increasing frequency is the method employed by quanta to store energy.

Field Structure's interpretation of $E = mc^2$.

1. The number of circuits (m) equals the fermion mass.
2. The number of loops in a circuit equals the kinetic energy of the fermion mass, which is (c).
3. The number of twists in the loops of a circuit = kinetic energy (frequency) of a boson also equals (c). The two 'c' values combine to produce c^2.
4. The relationship of the two SOL (speed of light) values (in c^2) to the mass value is fixed. The relationship of the number of loops of a line of action to the number of twists on a line of action is fixed, the relationship being the number of loops is the square root of the number of twists.
5. For every value of mass (m) there is that number squared for the value of its kinetic energy.
6. This relationship between loops and twists when charted produces the Serpinski's Fractal pyramid.

In FST terms, the SOL (c^2) is a constant because the mass number is always the square root of the total energy of the FS. The inverse square law comes from this relation. The polyhedron nuclear mass field of a fieldstructure uses the tetrahedronal circuit architecture where three line loops of action interact at a vortex. If there are four lines interacting at a vortex, it is an octahedral vortex, and if icosahedral there are five lines of action interacting at a vortex. Six lines of action at a vortex in three-dimensional space will not produce a 3-D closure of space. No 3-D space polyhedron has six lines converging on a vertex (vortex). More than six produces interesting spaces that are beyond the scope of this paper to investigate. Beyond the tetrahedronal arrangement, all other polyhedral circuit architecture will be unstable spatially and collapse back to

the stable tetrahedral circuit architecture. This issue is taken up again on page 17.

The mass field of a FS is defined by the polyhedron that the interacting loops of action create at the FS center. The fact interacting loops create 3-D spatial form is new to science and geometry (see Fig. 20). FST refers to this polyhedron as the *nuclear* polyhedron. There are times when this polyhedron appears in the energy field of a FS as well, so it is important to know where the polyhedron is occurring, in the nuclear mass field or the energetic energy field that surrounds the nuclear mass field. *In the simplest cases, when the nuclear polyhedra are one of the five Platonic solids, the mass number is a count of the number of circuits. The energetic component of the system is a count of the number of twists those circuits make, times the number of loops those circuits make.* It turns out that the SOL (speed of light) is a constant because it refers to the fact that a circuit is also one unit of time (speed plus distance). It has a fixed relationship to the circuit and hence no matter what the mass, what the number of circuits, the speed of that action event will be same as the mass value (m). A circuit is a unit of time *and* a unit of space so that the mc^2 ratio is always preserved. How circuits of action interact to produce a polyhedron mass field at the nucleus of the form will described in the next few pages.

Energy can be added by increasing the frequency as noted in Fig. 5, or it can be added by increasing the number of loops in a circuit as in Fig. 6. At the quantum level, to energize a structure, the frequency must be increased, which is done in a FS by twisting the line of action. A circuit can have many loops, each one being numerically and energetically equivalent to a twist. It appears that the number of twists can be no greater than the cube power of a particle's mass value, i.e., the number of circuits in the structure. Beyond the cube, the structure will morph into the rest state (lowest energy state) of the next higher particle in the hierarchy. If the form to be energized is a single electron neutrino, to give one example, when the energy input is the mass value cubed, the particle will become the muon neutrino, which is the next higher FS having the same number of circuits.

If the FS is a boson, adding energy will be a twisting issue as in Fig. 5. Adding energy loops to a fermion circuitry within the acceptable values of the particle's platform will not change the particle's specie but will change the energy value. To change the specie of a fermion particle requires the adding of loop/circuits of energy to the intrinsic mass field. For now it is easier to distinguish boson and fermion differences as to whether the energy is a twist to the line of action (boson) or has a new circuit been added or taken away. Light boson energy

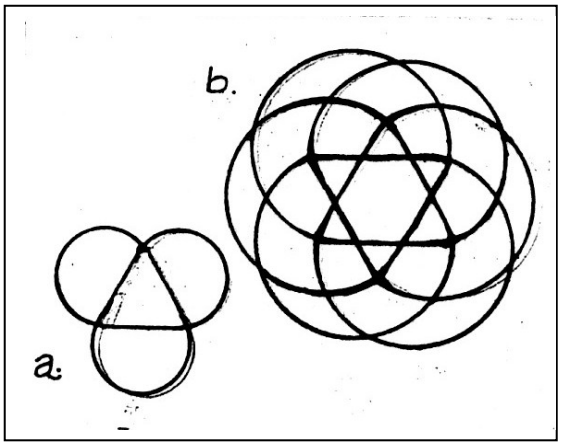

Fig. 6: Adding loops to a single circuit as a way of adding mass energy to a FS.

can be added to an electron's circuitry because it does not change the number of circuits. It only increases the number of twists on the circuit/loops it already has, which results in increasing the frequency of the circuit's wave.

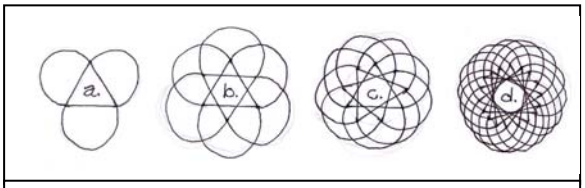

Fig. 7: Adding energy by adding new circuits. It is significant that the order in which vertexes are connected determine whether the form adds loops to a single circuit or requires additional circuits. Notice the volume of the action field does not increase while the energy does.

With these basics, we begin building the hierarchy of fieldstructures beginning with the simplest notion of action, the action loop. The building process will proceed as follows:

1. **Using only loop architecture, a structural model of radiant energy will be constructed.**
2. **Once radiant energy is established, it will be shown how radiant energy is localized in the form of a *speed of light* (SOL) quantum, i.e., the photon.**
3. **Then the photon is further stabilized into the SOL particle having minimum mass, the neutrino.**
4. **Next SOL neutrinos are stabilized to form a particle that has a rest state and mass, the electron.**
5. **Once the electron particle with a rest state has been evolved, the three major categories of fieldstructures are accounted for and the building of the other known particles can precede using combinatory interactions of these three action structures.**
6. **This paper will introduce the main fieldstructures of first generation particles.**

Actor – The Boson family of structure

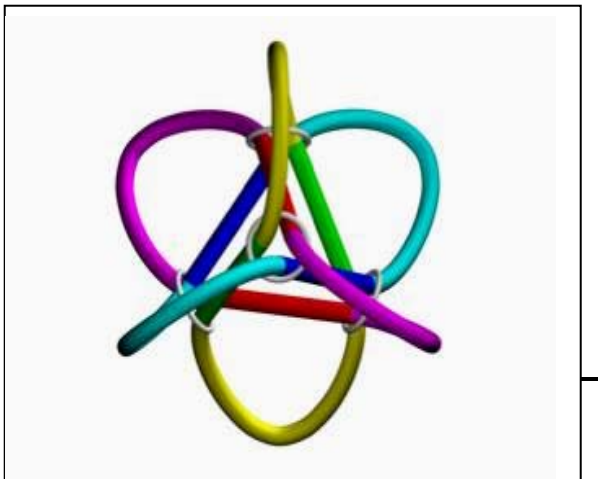

Fig. 8: **Restrained Actor**
An Actor that is not retrained by binding the vortices together with rings will dissemble, disassociate and collapse.
CAD rendering by Joseph Clinton

A simple loop of action is a single circuit of action. If a simple loop is bent into a wave, it will not hold its wave unless another loop of action of the opposite handed is introduced. The fact the second loop has to be of the opposite handedness is not apparent in the completed structure. The two spiraling loops look to be the same when in fact they are mirror opposites. In a plane involving two dimensions (x and y axes only) as seen in Fig. 3, the wave can be sustained in time. Alternatively, by introducing a third loop correctly and using a restraint at each place the bent loops will produce a structure that will not be self-sustaining in time without. Although this structure is not a natural form since it uses an artificial connector device, the rings). In the simplest of cases, the three loops as seen in Fig.8 can contact to form an internal space of a tetrahedron defined by the four vertices where the loops touch producing the tetrahedron. Since the lines don't *intersect* but instead *interact*, these vertices are called *vortices* in FST. By placing a ring around the loops (or tying them together) at the vortices as shown in Fig. 8, the form will be self-sustaining. If the rings or some such restraining device were not employed, the bent loops would be free to unbend and move apart.

Actors that kinetic "moving apart" type structures. They are the structure of radiant energy. When the cw and ccw actors are not sharing the same domain, they shed energy in the form of radiant waves.

The **"restrained actor"** with its attending restraining rings as shown in Fig. 8 is not a natural form in the sense it exists because of the introduction of a device, the rings at the vertices, which are needed to hold the loops together. The radiant potential, i.e. the disassemblage of the loops, is stopped from occurring by the rings. If the restraining rings are removed, this structure will explode, if highly stressed, or simply fall apart depending on the amount of torsion force in the bent loops.

The restrained actor is related to the tensegrity and was actually discovered when the outside tension lines of a tensegrity were replaced by torsion loops. Doing this, the tensegrity morphed into a fieldstructure.

If we imagine the loops actually look like the twisted lines of Fig. 5, and had millions or billions of twist, once freed to untwist, it can be seen that the compacted loop would expand greatly the volume expanding $2\pi r$ for each unit of quanta squared. In this way a unit of quanta could expand a billion fold. The mechanism for an energy field to expand can thereby be modeled as when light is released from an atom for instance. The implication is light would loose energy as it radiantly expands, an opinion shared by only a few in science today.

An intriguing question to ask would be: Are there a finite number of twists possible for a fundamental loop of action, which is tantamount to asking is there a frequency limit for a line of action? We know of no limit for open radiant bosons, but energy confined to a mass does have definite and well-known limits. Why then does fermions have strict energy limits while bosons seems to have no upward limit. Bosons do, however, have a lower limit as dictated by the Planck's

action constant. My hunch is that there is an upward limit as well and one day we will figure out how to find it.

If **E = *h*f**, then in this model, *h* would be the loop and f would be the number of twist in the loop. In Fig. 5, each loop has a frequency (f) that corresponds to the number of twist (nodes) in the loop. In Fig. 8, the number of loops corresponds to the number *h* and the frequency *f* is the number of twist in each loop. The numbers of twists in the loops of Fig. 8 are the number of twists in each loop. Each loop is twisted 180˚ making the total twist equal to 1080˚. Dividing by 360 gives a value of 3 for f. Thus the energy value in FST of this structure is $E = 3(3) = 3^2 = 9$.

A particle is a wave (or waves) that is confined to a limited spatial domain. The confinement is accomplished through the topological properties of the structure so that the energy of the structure is not dissipated below its rest energy state. While the Restrained Actor stops the unfolding process by tying the action loops together at the vortices, in nature there are no such ties at the vortices to prevent the structure from radiantly decaying. Nature has a more natural way of tying chiral opposite actor bosons together to form particles.

The actor with minimual twist would have the identical form as that of the action plenum. When an actor releases all its energy (twist), it goes from a bent and curled higher dimensional form to a unbent uncurled lower dimensional form. In doing this it returns the energy taken form the action plenum to make the higher dimension action particle.

In Figs. 10 and 11 note how loops hold their twist irrespective of the how they are made either by taking two loops and twisting them together (Fig. 10), or taking a single loop and winding it around itself (Fig. 11), both methods hold their twist. They do not unwind because at every point along the joining surfaces, the loops are opposing each other, trying to move in the one direction where the other loop is located. Each is trying to move into the other's space at each point along there joining surfaces. The line of contact is a straight line, while the volumes of the loops are helical.

A single loop has an odd frequency number while a form made of two or more loops have an even number of loops. In the natural world, this will become an important difference between whether the structure is a boson or fermion. It is the origin of particle Spin. Boson circuits' rotated 180˚ and 360˚ rotations will be fermion.

The stability of loops of action shows us that a wave has to be a closed continuum. If the loop were cut, the form would unravel. This strongly suggests that quanta are waves of action/energy because they are in actuality interacting twisted loops. If quanta were open strings there would no mechanism way for waves to form. Structurally speaking the only way to generate and sustain a wave is to interact two waves of opposite handedness together. This will require the simplest closure of space to have 720 degrees of twist. The two ways have to be mirror images of each other.

Fig.10: Two loops linked together produce an odd frequency number on each loop. The two loops added together, of course, produce an even number.

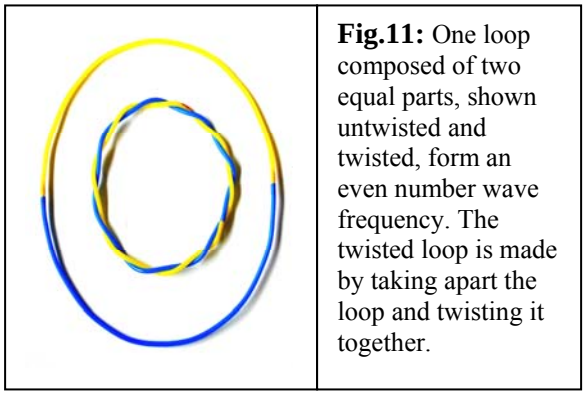

Fig.11: One loop composed of two equal parts, shown untwisted and twisted, form an even number wave frequency. The twisted loop is made by taking apart the loop and twisting it together.

Waves are the result of opposite chiral loops of action/energy/force interacting with each other in the same domain.

Nadi - The fermion/neutrino particle

To explore the Nadi, it is necessary to explore further its component structure, the Actor. As mentioned, the Actor is a radiant structure whose business may be seen as responsible for returning action/energy back to the action plenum from whence it came in order to produce a fermion mass. The compacted energy of a fermion is converted into boson radiant energy by providing a way for the fermion to unfolding its stored twist energy. As we know, any energy in a fermion above the rest state is radiated away unless that energy is sufficient to morph the fermion into the next higher particle structure. Boson energy that cannot be knotted into the fermion mass structure is returned to the action plenum allowing the plenum to relax (eliminate the corresponding gravity) and regain homeostasis.

The Nadi structures in Fig. 12, 13, and 14 are stopped in time due to their lacking field kinetics. Were they kinetic action structures with processionally advancing orbits, the form would be a solid weaving of loops. Luckily the scalability of the structural makes these memcroscale models of microscale events possible. We are able at the mencroscale to halt the kinetic action of these orbitals so that we can see the structure frozen in time without having to deal with a proportional up scaling of time and speed. We are able to compact the spatial extension to its minimum value. In nature, at both the micro (particle world) and macro scale (astronomic scale), the line of action is unable to return to its

starting place in one revolution and must continue to orbit processionally through successive 360˚ revolutions until it again can find its starting place and complete the circuit.

The inability of action to return to its starting place without first processionally making a full 360˚ through all three x, y, z axis of 3-D space, is the reason why structure is always and only polyhedral in nature. It is the basic skew of space/time that makes our universe dimensional. Without this inherent skew, action would collapse to a point and space, as we know it, end.

While fermions cannot do things in an instant, bosons can. If fermions try to exceed their circuit time limit, the assemblage will radiate away any excess energy that cannot be accommodated in the required cycle time.

Fig.12: Tet Nadi, Vortex view of nuclear tetrahedron

Fig.14: Tet Nadi, 3/4 view of nuclear tetrahedron.

From the FST perspective, a mass has a specific amount of time in which the action/energy has to complete its circuit. A boson by definition does this in one instant of time. That is why time and space are calibrated by the speed of light. Although this is hard to visualize, a unit of light is one instant, meaning the time action takes to complete a light circuit is one instant, a boson instant. Space/time is constructed of boson instants.

Forms made of matter have duration, a time line, beyond which they cannot self-sustain. At the level of organisms, this allowable time takes the form of a lifetime. The human organism has an otherwise normal lifetime that takes sixty to one hundred years to complete. A neutron on the other hand has on average

about seventeen minutes before disintegrating.

Form in FST is entirely the consequence of the binary complexity that can be achieved by cw and ccw Actor loops. *Binary in nature, fractal in sequence, hierarchical in architecture, loops of action reduce form to a few variables that account for unimaginable complexity sharing with cellular automata the ability to build complex structures with a simple set of instructions*. FST concludes that everything in the universe is the product of, and ultimately reducible to light, which is structurally a chiral Actor fieldstructure. FST shows how radiant Actor structures can be confined to a structural locality (Nadi) and then interact Nadis to produce matter, the entire complex of which being no more than twisted loops of action that have interacted to form complexity.

Fig.13: Tet Nadi, edge view of nuclear tetrahedron.

While we know energy dissipates, we also know energy can be confined; mass is confined energy. The question to ask is *"What is the attach/release mechanism that determines whether the action event will be bosonic/energy or fermion/mass?"* Energy is a structure that can be either confined as a fermion or be radiant as a boson. The question is what structure can do both. A valid structural model will have to have a simple mechanism that will release and incorporate energy with the only requirement being that it is not necessary to induce an element that is not already in play. *In FST, the only quantitative building element is the loop. The qualitative factors that affect the loop are their ability to bend, loop, link, twist and knot.* Switching between boson and fermion states is a switching operation and switching is a twisting/looping issue.

FST tells us the mechanism that confines energy is the twisting of the orbital loop/circuitry. When cw and ccw Actor loops interact, they bind together and form a bond. They disassociate when a half twist rotation occurs. This makes a cw loop connect to ccw loop and the circuit short-circuits, breaking the chiral separation between cw and ccw loops so that the cw or ccw circuits form independently. With the chiral symmetry broken, the structure is free to become radiant energy and dissipate.

Forms switch between being open (boson) and closed (fermion) forms simply by rotating of the line of action so that the defining factor is whether or not, even or odd frequencies are produced. The rotation of the line of action circuits the action/energy to fix the field to a locality or radiantly expand it.

The circuit (s) of a fermion takes on energy by having the line of action (the orbital) twist about its axis and vice versa for the expending energy. There is a limit to the number of twists a circuit/loop can accommodate. Exceeding the limit results in the formation of new loop or in the radiation of energy from the structure. Loop issues change the fermion while twist issues change the fermion's energetics.

How something so simple as loops of action could produce a universe that includes human beings is a testament to the profundity of field relationship. All the ways we have of describing form are description of how the action loops interact.

The Nadi has interacting mirror opposite chiral Actor circuits. A wave waves and holds its wave at a particular frequency when cw and ccw action circuits of the same frequency interact.

Field Structures Mechanics

In the natural world, the Actor is postulated to be either a cw or ccw light wave. The photon, the light particle, is where the Cw and Ccw Actor waves interact, which only happens where the wave entangles with a mass. Dr. Cynthia Whitely has proposed that light remains "in touch" with the source until the wave reaches a new mass destination, after which it "lets go" of its source and attaches itself to its destination.[1] This idea by Dr. Whitney is structurally consistent with FST's findings. The photon is where an Actor/wave becomes entangled with a mass. When the Actor/wave is not attached to a mass, it is a SOL (speed of light) radiant wave. When entangled with a mass, it is a SOL bound wave that lives inside the domain of a mass as a twist of its action circuits.

The simple Nadi seen in Figs.11, 12, & 13 is a Nadi that has a tetrahedronal nucleus composed of three cw and three ccw Actor circuits interacting together.

In boxes below I use a notation for depicting 3-D Field Structures by defining the rotation of the loop(s).

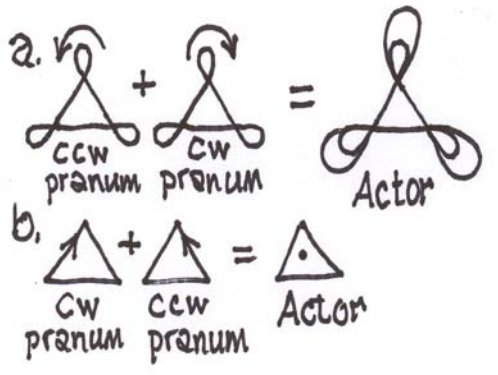

Fig. 15a: Cw + Ccw actors combine in the same domain to form an Actor.
Fig. 15b: A simplified notation of 16a above. The dot indicates the form is a composite having Cw + Ccw loops.

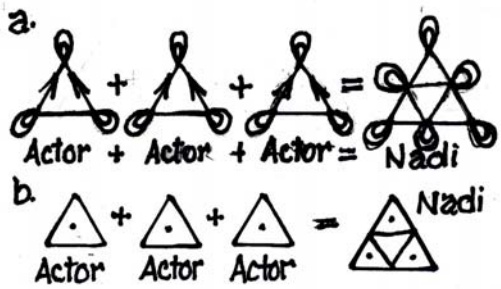

Fig. 16a: Three Actors combine to form a Nadi. Loops are noted as doubled in the Actor to show the Actor is a product of a Cw + Ccw actors.
Fig. 16b: A shorter notation for 17a.

The Nadi[2] does not exhibit charge chirality because both the cw and ccw circuits of action are present. Instead it exhibits what FST terms **"REALITY"**. Reality concerns real-matter/anti-matter issues, as opposed to fields, which represent fermion handedness issues that are referred to as positive or negative charges. The phenomenon of charge that occurs at the fermion level of fieldstructures is the phenomenon of reality at the level of the Nadi. The Actor

[2] *Nadi* is Sanskrit language for a channel and is understood to mean a channel through which the subtle life force flows.

wave and Actor photon phenomenon do not exhibit electromagnetic handedness because light is a more elementary structure than an electron. The electron, a fermion, is the first (simplest) FS to exhibit electrical charge properties. At the Actor and Nadi level, handedness is not a charge issue. It is a reality issue in the sense mentioned above. Actor/photon and Nadi/neutrino handedness set the stage for the building of real and anti-matter particles. The proof of this is that while chirality is a property of light, it is unaffected by a magnetic field.

Light is the circuitry, the railroad tracks so to speak, over which the electron follows whether the electron is free of, or bound to, a nucleus. The electron follows the Actor light wave circuitry. It is the movement of electrons that invoke charged fields. We get to see that light is chiral when an electron is observed in a light field that has had one of its chiral circuits cloaked so that the other chiral light circuit remains to direct the electron and skew its path. The electron's path is bent into an orbit because one way of looking at it is that the path it follows is determined by the particular chirality of the light wave to which it is attached. Unbound light 'appears' to travel in a straight line because the place where the cw and ccw loops interact is moving in a straight line form a given source even though the wave is spiraling radially as it expands (see Fig. 18). A free electron, while it may not be bound to a specific domain (nucleus), is, nonetheless, bound to the circuitry of Actor/light wave and to the ever enlarging radiant light wave loop of that light wave.

The Nadi forms when three cw and three ccw Actors interact to form a localized energy form, albeit, a SOL particle, which in its unbounded state has no rest state. It is productive to ask why there are six Actors, three of each handedness? This is the same question physics has been asking, i.e., why are there three quarks, three neutrino, three electrons (muon and tau being more energetic versions of the electron), and why all these have mirror image anti-particles. When we see the structural context in which all this is happening and how the loops define them, and only them, does the majesty of this structural hierarchy becomes astonishingly apparent. (Excuse my enthusiasm).

At its center, the Nadi has a space defining polyhedron, although the space it defines is the minimum most spatial event in our universe, however a space still sufficient to give the Nadi a mass. *The Nadi models the neutrino.* There are two realities of the Nadi, the real and anti-Nadi/neutrino. The neutrino also has three forms in real-matter and three in anti-matter forms, just as are fieldstructures are limited to the same arrangement. *One test of the validity of the fieldstructure hierarchy is that it should be the same hierarchy found in nature, no more and no less without exceptions.*

In Fig. 17, when the cw circuits of the Nadi are outside, i.e., the red sticks of the polyhedron are outside, and the yellow sticks are inside, then the Nadi is said to be 'real' structure. When the ccw yellow circuits are outside, the Nadi is said to be an anti structure and in nature is an anti-matter particle. In Fig. 18, the yellow ccw circuits are outside the blue

circuits making the Nadi an anti-structure and in nature an anti-neutrino. Like radiant energy, both are handedness of photon light are visible to the real-matter world as well as the anti-matter world. When light

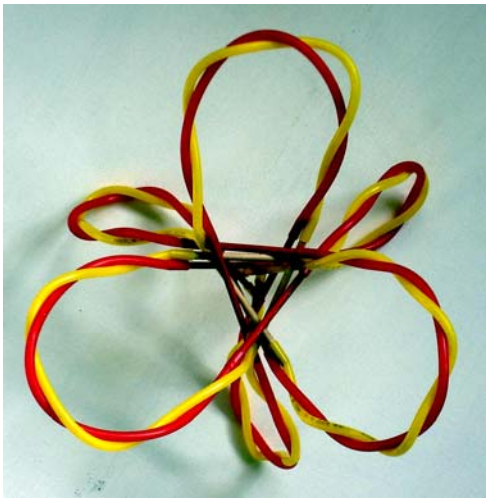

Fig. 17: **Tet-Nadi, face** view. Three red Ccw loop/circuits share the same spatial domain with the yellow Cw loop/circuits.

becomes entangled to produce the neutrino and anti-neutrinos, the anti-neutrino disappears by the cloaking of the real neutrino. Once the Nadi/neutrino appears in the hierarchy, anti particles are no longer visible.

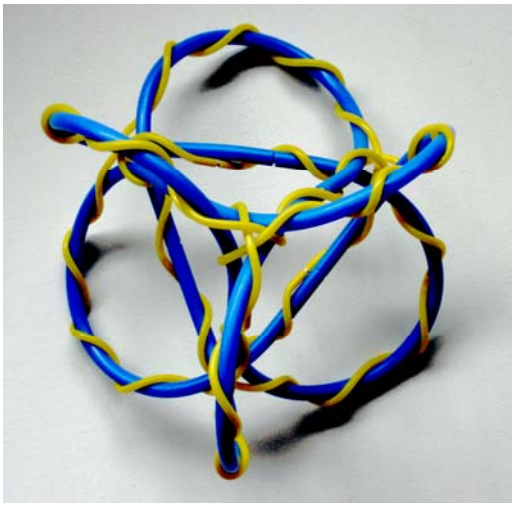

Fig. 18: **Tet-Nadi, v**ortex view. Ccw thin (yellow) tubes twists around the thick cw blue tubes.

In making a Nadi, nature has to have one or the other of the cw or the ccw Actor circuits inside and the other outside. This is self evident and verifiable when Nadis are actually made. They both can't be inside and outside at the same time. It may be necessary to build the structures to see this for yourself. It was for me. You cannot tell in an Actor if the cw or the ccw circuit is outside unless you decide in the beginning which is which. Once built, they appear identical. They are both equally outside, or you can say half the time one or the other is outside. The way to tell if a Nadi is real or anti is to inspect a vortex and determine if the cw or the ccw circuit is outside and hence covering the other *Note: FST uses the notation [+matter] for real -matter and [–matter] for anti-matter.*

Nadi/neutrinos do not have charge because the particle while being a fermion is nonetheless a SOL particle. The neutrino is listed as a fermion because as a fieldstructure its nuclear polyhedron encloses space, a characteristic all fermions share; something a proper boson does not do. However, the neutrino is not a full-fledged fermion because it still needs its opposite handed partner to be self-sustaining.

Field Structures that need both chiral circuits in real space/time are bosons and hence have a Spin-1 designation. However, fermions at a higher structural position in the particle hierarchy do not 'seem' to need both chiral particle counterparts present to be self-sustaining. This explains what happened to the missing anti-matter in the universe. Particles

with only one chiral circuit(s) are fermions. Fermions have only one chiral loop even though the cloaked anti-article is present. Fermions can sustain their structure “apparently” with only a right or left handed circuitry, thus they are designated Spin ½ particles. Particle, such as quarks, with 1/3 or 2/3 spin have combinations of boson cw and ccw circuits such as one cw and two ccw or one ccw and two cw. Only Spin ½ particles will be stand-alone stable with a rest state. Chirality, as is known, is preserved in all particle transformations as it is in all FST interactions. Thanks to FST, Spin has a very real structural explanation. The spins we find in particles are exact and none-arbitrary. FieldStructure geometry spin is equally exact and has the same none-arbitrary chirality. The same spin pattern in nature as seen in fieldstructures.

Returning to the hierarchical development of the fieldstructure interpretation of particles, to follow the natural order of things and ascend the particle ladder of structural complexity, we have to go from a SOL (speed of light) Nadi/neutrino boson particle, to the simplest fermion particle that can have a rest state, the electron. As in the Actor, there are at this time known to be two forms of the Nadi fieldstructure, clockwise and counter-clockwise. When three cw and three ccw Nadi circuits interact so that the three ccw circuits are on the outside and the three cw circuits are on the inside, a real mass particle of the a higher field order is produced, i.e., the electron. When the reverse arrangement is made the particle produced is an anti-electron also called the positron.

Recall it was mentioned that when the Nadi is built, a decision has to be made as to which chiral polyhedron is inside or which is outside. This interaction produces a form that now can have a rest state. The rest state is made possible by the fact that while the Nadi itself is not a knotted structure, it can produce a form that is knotted when interacting with its chiral partner. This is important news! The Nadi is not a knot. It is a linkage (see Fig. 2) of cw and ccw Actors. Actors can’t knot and it follows a true boson cannot knot either. They structurally cannot knot because their Actor loops cannot be broken to allow the interpenetration of the loops that would have to occur. They are linked and remain linked no matter where they go in the SOL across the universe.

Actor and Nadi loops are linkages. FST presently seems to be saying they are always linked. There is no way presently known that the fundamental action loop of the AAM can break and yet it is equally difficult to see how they could be made if they could have gotten linked in the first place. If the fundamental loop could break, space could be torn which is a jarring possibility to contemplate for that would indicate there is something other than the space generated by the action matrix.

FST at this time has decided to proceed on the assumption that Actors once formed are indivisible and they are linked. Allowing this assumption permits FST to develop logically. Knots, however, can be broken but linkages cannot. A knot is sub-luminal, composed of time units. A linkage is luminal and is a single time unit. When Actor linkages interact they produce the Nadi, which is also a

linkage. With the formation of the Nadi, the next family of Field Structures, the fermion, can be constructed.

For a knot to form, it seem there must be duration of time involved, an interval between start and end on a loop of action. If this is allowed, the loop can no longer be an instantaneous event. It would loose its status of being a unit of time and space, as is a boson. The fact the Actor is a SOL event means it exists as a unit of time and is thus in a timeless and spaceless world both with itself and with all other loops. The Action Plenum is absolute for this very reason. It is everywhere instantly because its units are not experiencing change. From our perspective of being in a sub-luminal fermion world populated by objects having a rest state, we see time and space as real and the world of the instantaneous as unreal. If we were light beings, we would instantly see the universe is not a space/time event. A being having the light frame of reference would see only now, but that now would span all past and future. In other words, we know would know of no event we must factor into consideration that is a subset of the Actor. The constant *c* would vanish if we were light beings mathematicians.

The new family of form produced by the Nadi is the fermion family of form. Fermions are a product of Nadi/neutrino interaction. Unlike Actor/bosons, Nadi/neutrinos interact to produce particles that not only have spatial integrity (remain confined to a spatial domain) but also can be at rest. To get the fermion particle to stay still takes three cw and three ccw Nadi/neutrinos to interact. This interaction produces the electron and positron. If the outside Nadi is ccw the particle will be an electron while if the outside Nadi is cw the particle will be a positron. While the electron/positron fermions created are composed of SOL Nadi/neutrinos, the electron itself is capable of being at rest. This is a major achievement in the history of the universe. It is interesting to speculate on how interactions would come about. The e^- and e^+ become the first particle with mass and hence the basic unit of measurement for particle mass. Once energy can be confined, matter having a rest state can be created, and the business of building a universe can begin in earnest.

Important note on Field Structure models: All Field Structure models are inherently structural. No fastening devices such as connectors, screws, glue, ties, strings or bands, etc. are used. These structures are self-sustaining, stand-alone, conceptually and materially pure forms.

The Structor – The fermion family of f

FST explains that we actually nine dimensional plus time creatures.

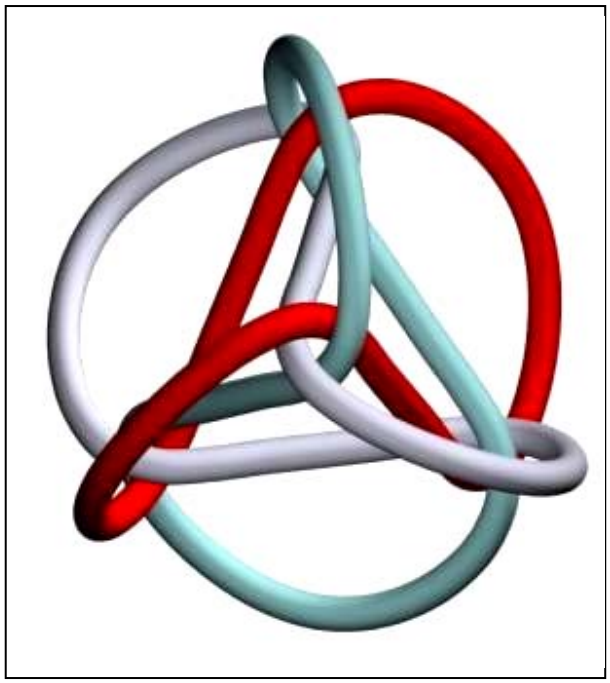

Fig. 19: Tet-Structor
Three loops rotating Ccw, vortex view
CAD rendering by Joseph Clinton

In Figs. 11, 12 & 13 we visualized that circuit is the trajectory of a Nadi/neutrino and that within each of the Nadi circuits are Actor circuits. This notion of circuits within circuits is, I believe, a new way of looking at particle architecture and gives a way to visualize the way action curls up to become the building block of a higher dimensional structure. Each circuit is the orbital path of a lesser particle that lives inside the path/tubes. This seems to be how nature manages dimensions. At any opportunity these curled up structures can come bursting out of their confinement should the higher dimension particle they create decay from over loading the circuit. As mentioned, this is how

We have introduced at the beginning of this article the basic loop of action, which we will now call the energy particle of the First Field Order (FFO). The name of this energy particle is *Pranum.* The other particle that makes up the duo of a FFO is the mass particle. The mass particle in the FFO is called the *Prana.* These two particles form the Action Plenum from which all energy and matter forms are derived. Pranum and Prana are too small to be detectable by devices operating at the photon/light platform of structure. They have, however, been the objects of study by Vedic sages. It is through them I first became aware of the Akashic field, as they are known in Sanskrit. Physics has only in recent times flirting with the idea of the ether, its name for the Akashic field, or Action Plenum as used in this paper.

The particle hierarchy begins with the First Field Order (FFO) when it interacts with itself to become the energy particle of the Second FO (SFO), which is the photon. In the simplest form, a set of three SFO energy particles (photons) forms a Field Structure and produces the mass particle of the SFO, which is the neutrino. The photon/boson and neutrino/fermion constitute the SFO. When a group of three SFOs (or a single SFO with the

energy of three SFOs) get together, they produce a fieldstructure that is the energy particle of TFO (Third Field Order), which is the electron. At this point the FS concept of particles departs from standard thinking, because even though the electron is considered a fermion in standard thinking, when it is bound into a Field Structure it behaves as a boson. It only behaves as a fermion when not bound in a fieldstructure. Since we study the electron in its unbounded state, our impression is that it is a fermion. When electrons interact or an electron become sufficiently energetic, the electron (s) produces the mass particle of the TFO, the proton. It takes the energy of three electrons to fieldstructure the proton into being. The energy particle of the TFO is the electron and the mass particle of the TFO is the proto

We don't see them because from our perspective they are not space/time events since they are bosonic. They inhabit the entire loop as an instant. Their location is dependant on their energy, which is tantamount to saying, to the number of twists and loops in the circuit. Each circuit is processionally rotating through 360°. To do this they must pass through each of the positions of the other circuits so that the circuits are in essence performing a three-dimensional rotation.

In time Fig. 19, 20 & 21, the form would assume a spherical shape when, with additional heat, more loops are added. It accomplishes the looping within one instant of time. The more loops the faster the looping is done, i.e., the more quanta that are needed. Time is thus a measure of the number of loops that are in a field. A field can have only as many loops as the square of the number of vortices in the nuclear mass polyhedron portion of its field. As long as the number of loops is the square of the number of vortices the structure will preserve the $E = mc^2$ relation, or as the formula is written in FST, $\mathbf{E=m^3}$ where m is the number of vortices in the polyhedron.

When a Field Structure such as the Structor is built, the bent loops want to unbend but are prevented by the other loops trying to unbend as well. Each circuit blocks the other. Taken as a whole, the **Structors are three-dimensionally knotted loop/circuits of action.** This is a new family of form to math and science. Stability is achieved by the bent loops thrust trying to expand, which in doing so opens up an interior space in the form and creates a polyhedron. In the Nadi structure, the dynamics of the loops squeezes the central polyhedron making it as small as possible, while at the same time the outer loops are trying to expand. That is why the Nadi/neutrino structure has minimum mass, because the spatial extensions of it mass field is the minimum possible needed to have particle attributes, i.e. having the attribute of being in a place and not everywhere.

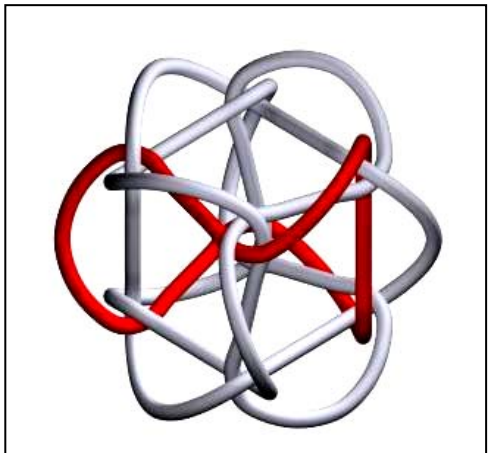

Fig. 20: Cube-Structor
Four loops rotating ccw, one shown in red.
Vortex view.
Rendered by Joseph Clinton

While these computer generated images may not necessarily 'look' structural, when they were built in 3-D with loops made of materials that resists bending, (i.e. semi-rigid material), the form is self-sustaining and spatially stable. See Fig. 27, 28 and 29 for photos of working structures.

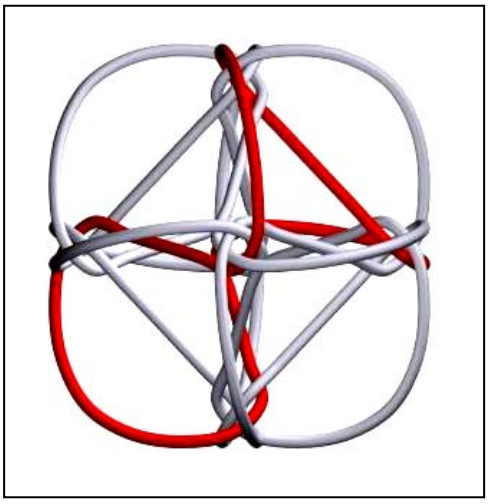

Fig.21: Octahedron-Structor
Four loops rotating Ccw.
Vortex view
Rendered by Joseph Clinton

The structure assumes their stable shape by finding a balance between these centripetal and centrifugal forces within the loops. In the Structor, the loops are trying to expand but cannot do so because the loops get in each other's way. The entanglement is pushed out as far as the polyhedral portions of the loops will allow in the Structor, while in the Nadi the entanglement shoves the polyhedral portions of the loops toward the center of the form. Hence bosons are particles are without interior space, while fermions are particles with interiors polyhedra space. Structors expand the nuclear polyhedra, while Nadis contract them. There is an inverse symmetry between the Actor/boson and the Structor/fermion.

There are two ways known at this time in FST of confining energy to a three-dimensional locality (remember energy equals the Actor). One way is to have three cw Actor loops interact with three ccw Actor loops as seen in Figs: 11, 12, and 13. This produces a structure with maximum symmetry, a regular Platonic skew polyhedron.[3]

The other is to have a single cw circuit or a single ccw circuit makes three loops each so that one circuit is looping three times. As far as I know, single circuit fieldstructures are asymmetrical. In the case of a tetrahedron, using three circuits as we have already done in the Structor (Fig. 19) produces a nuclear polyhedron with symmetrical 60˚triangular faces, while a single circuit tetrahedron (Fig. 22) produces an isosceles tetrahedron whose four faces have a single 60˚ equilateral triangular face at the base and three 45˚ x 90˚ degree triangles joined to the base. To achieve an overall symmetrical form with a single circuit FS requires a cw and ccw loops to share the same circuit. Nature frequent does this. It is the source of asymmetry in nature.

cw vortex

[3] All geometries in FST are c… …ally the word "skew" is dropped in desc… …d when it is clear the context for the discussio… …ncerns the skew geometry of FST.

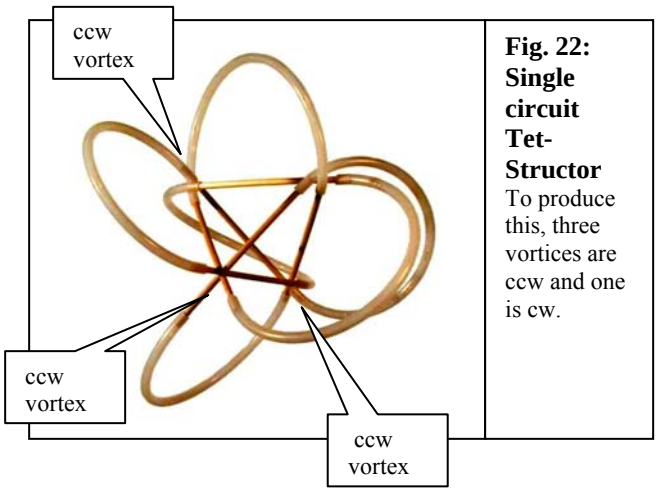

Fig. 22: Single circuit Tet-Structor To produce this, three vortices are ccw and one is cw.

Fig. 23: Single circuit Ambi-Tet Structor Cw and Ccw tetrahedrons at the nuclear center of the Field Structure are circuited together by connecting the yellow sticks to the blue sticks in the proper sequence. By reversing circuitry back and forth in this manner a single circuit is produced from the same number of sticks and tubes.

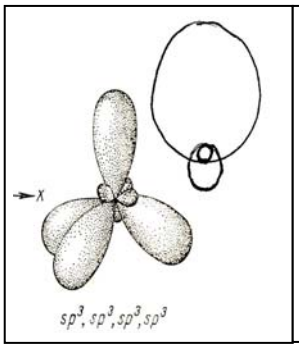

Fig. 24: Electron clouds of hybridized carbon

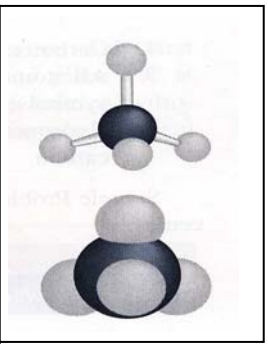

Fig. 25: Methane molecule

The Structor is a stable, stand-alone structure that unlike the Nadi/boson/neutrino is stable without needing to have cw and ccw circuitry present. Spin-1 Nadi/neutrino structure needs both cw and ccw circuitries to be a particle (have location). Spin-1/2 structures are the Structor/fermion family and only need either a cw or a ccw circuit to be stand-alone stable. While both cw & ccw are not necessary in the same domain as they are to make an Actor and Nadi, both can be present and arguably may be naturally sharing the same domain. Having both cw and ccw Structors in the same domain, offers new structural possibilities.

Shifting the circuiting sequence changes the entire character of the form. The three cw circuits and the three ccw circuited polyhedra become one circuit if in the energetic looped domain of the circuits are switched so that the cw circuits connects to the ccw circuits and vise versa. In Fig. 23, the yellow sticks become circuited the blue sticks to make the whole form one continuous circuit. The overall form of the Structor changes radically from a spherical shape to one having four elliptical spheres converging on a common center. At the atomic platform of this structural motif, elliptical 'clouds' mimic the form taken by a carbon (fig. 24) and methane (fig.25) molecules. How a structure is circuited determines how energy flows and the form that results.

The forms taken by physical structures are determined by the nature of the action circuit(s), limited by available energy and the energy construct of the structure's position in the hierarchy. FST identifies these energy states by studying the circuitry of skew polyhedra.

Interpreting the physical form as the product of circuits of action opens a new door for understanding our world. This is the world of connectivity, of fields, and of deterministic relationships. In this manner FS can identify structure at the quantum scale and each succeeding platform of structure (atom to molecule to cell etc.) with an accuracy and precession not previously imaginable and not possible to detail in this short article.

The most symmetrical Structors are made from three circuits knotted together. These circuits (Fig. 19) are the three quark structures of the Standard Theory in physics. Quarks come in three forms, positive, negative and neutral. This corresponds in a FS to the cw, the ccw, and the combined cw/ccw all of which have been successfully modeled.

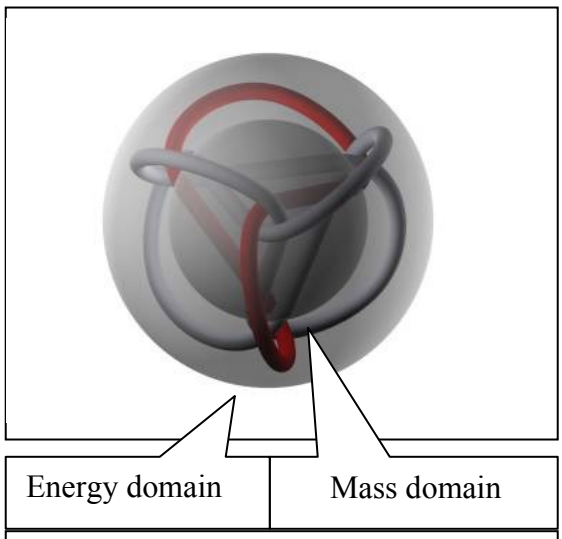

Fig. 26: Field Order (FO), composed of mass area defined by polyhedron and energy domains defined by portion of loop external to polyhedron nucleus.
Rendering by Joseph Clinton

A Field Order has two components:

1. A boson energy particle
2. A fermion mass particle

Each lower FO as a whole is the boson particle of the next higher FO. This is a crucial concept and provides the architecture on which mass builds in energetic complexity. The orbital boson particle of a higher FO is the total orbital motion of the lesser FO. The electron of the 3rd. FO is the boson orbital of the atom. The Electron is itself the interaction of Nadi/neutrino Field Structures. The proof of this hypothesis is that in the electron and positron interaction, the decay produces neutrinos that decay into gamma photons. The internal structure of an electron is two gamma photons, one Cw (Pingala Actor) and one Ccw (Ida Actor).

Stand-alone pairs of the First Generation particles, each pair is called a 'Field Order'.

The First Field Order cw loop **Pranum** combines with it symmetrical chiral counterpart the First Field Order ccw **Prana** to produce the 2FO energy particle the cw or ccw **Photon.** Chiral Photons combine to produce 2FO mass particle, the **Neutrino**. Neutrinos combine to form the 3FO energy fermion, the **Electron**. Electrons combine to form the 3FO mass particle, the **Proton.** The sequence continues.

Fig. 27: Tet-Structor, Wound wire producing a working 3-D structure. No sticks. Natural curves define polyhedron.

Model/photo by Joseph Clinton

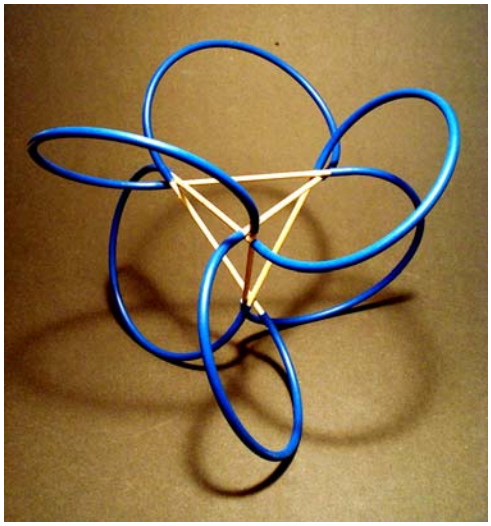

Fig. 28: Tet-Structor, Sticks & tubes, Working 3-D structure

Fig. 29: Tet-Structor hybrid
With inside mass field cw/ccw and outside energy field cw/cw. Shown to illustrate effects of circuit changes.

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action loop, to a wave structure (light wave), to a wave particle (photon/boson), to a localize, non-expanding particle that is the SOL kinetic Nadi/neutrino that has a definite spatial extension albeit exceedingly small, to a local particle wave that can be at rest, the electron/positron/Structor. We have processed from a radiant loop of action (pranum), to radiant energy particle (photon), to SOL particle having mass (neutrino), to a mass particle that can be at rest (electron), all in a self-consistent structural continuum

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particle that develops has picked up energy by adding loops of action, subsumed less Field Order particles, curling up dimensions and used them to define new larger field structures in a manner that is harmonious and logically consistent without the use of a fastening device. Only loops are used to make this entire diverse range of forms. Nature has not finished. The next platform of structure is yet to be introduced, that of the **"SuperStructor.**

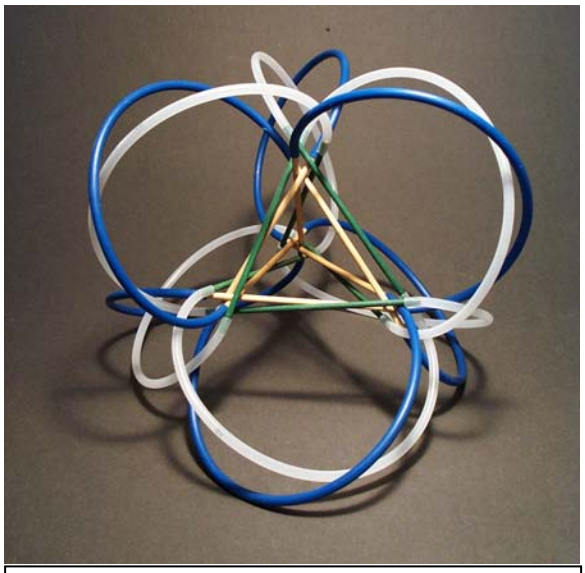

Fig.30: Ambi-Tet-Structor
Blue loops with white sticks are ccw,
White loops with green sticks are cw

The SuperStructor

The structure of a nucleon

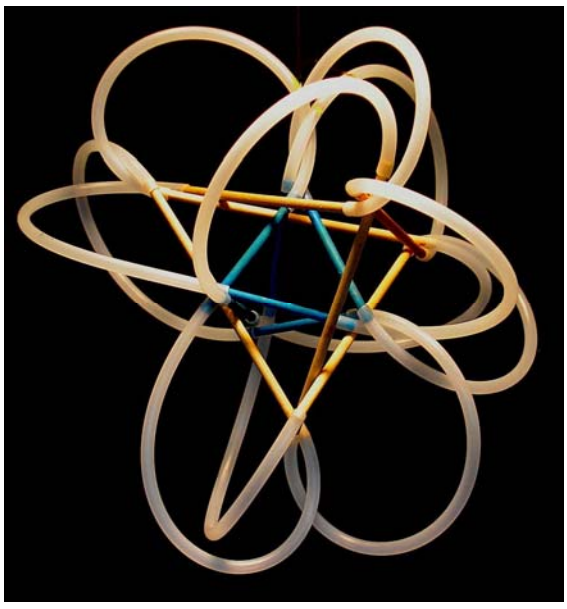

Fig. 31: Ccw Tet-SuperStructor

The SuperStructor takes the Structor to a new level of complexity. It is the origin nucleon structured forms such as found in atoms where there is a nucleus and a surrounding energy field inhabited by an elemental charged particle (electron). The SuperStructor (SST) pictured on this page is the simplest form made by building a larger Structor around a smaller one, and then circuiting them together to produce a stand-alone, stable structure of higher complexity and energy potential. The figure on this page illustrates that by building inner and outer tetrahedron polyhedra, the resulting structure embodies all the lesser structural platforms that are embedded in the higher order of complexity found in an atom's structure. Though I have shown only tetrahedron SuperStructors, all polyhedra can be SuperStructored (SST). All that need be observed in building a SST is that there are the same number of inner

nuclear vortices as there are outer vortices.

However, to make things interesting and to account for atomic platform fieldstructures, the outer polyhedron(s) can be successive shells of (polyhedra on inside the other. As long as the total number of outer polyhedra vortices equals the total number of the inner nuclear polyhedra the orbits can be established and the form made structural.

At larger platforms of structure (molecules, cells, etc.) intricate circuitries with multi-layering can be constructed. A stable stand-alone structure, however complex, is possible as long as circuits connect all the vortices in the end with no circuit left uncompleted. What fieldstructures show is that as the structural platform enlarges from atom to molecule to cell to organism, etc., all the circuits integrate as per the SuperStructor model. As you can see the circuitry becomes exponentially vast as the number of atoms, molecules and cells increase. To map the integrated orbital energy circuitry of complex hierarchies found in even simple organisms would involve billions of SuperStructor polyhedra. The important here is that if we agree with the fieldstructure interpretation then we have a way of accessing how the energy is actually flowing. It becomes possible to organize and design nano-scale structures.

The SST integrates the notion of nucleon with the notion of an orbital so that changes to one, distributes the energy throughout the system in a field-consistent-manner keeping orbitals and nucleon in synch with each other. In this way, the nucleons (inner polyhedron) dictate the number and orbital path of electron

We have introduced a new geometry that purports to relate to the forms found in nature. We are ready to see how these FS models generate the known mass values of fundamental particles. Particles are distinguished by their mass number. In FST, to obtain the mass value of a particle, the simplest and easiest way to view the process of particle hierarchy is to count the number of circuits in a particle’s fieldstructure. Later we will see by counting the number of twist, instead of circuits will be more accurate and useful. In the simplest case involving symmetrical polyhedra, i.e., the Platonic solids, counting circuits is the clearest way to understand the process but we cannot get closer than a whole number value because I use the electron as our counting unit since that is the simplest loop/circuit. Energy counting uses twists which is far more accurate but maybe harder to visualize.

To find the mass number in units of electron mass, the hierarchy of action loops must be constructed to determine the correct mass values of the bound particle. Once we know the mass of the bound particle, we can compute the particle’s unbound mass. The stand-alone mass is the mass physics measures. FST does this by subtracting the decay particles from the bound mass values it got when it built the particle

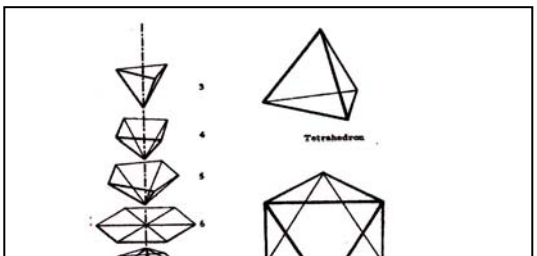

Fig. 32: The three energy families of particles are determined by the number of lines that can intersect at a vertex of polyhedra. There are only three such systems: Tetrahedron with 3 lines, Octahedron with 4 lines, and Icosahedron with 5 lines. Six lines will not produce a closed 3-D solid but a flat sheet. The 3, 4, & 5 intersections relate specifically to the 3 generations of fermion particles.

Standard Model physics makes the following distinctions for fundamental fermions:
First generation includes: electron, electron Neutrino, up quark, and down quark.
Second generation includes: muon, muon-neutrino, charm quark, strange quark
Third generation includes: tau lepton, tau-neutrino, top quark, bottom quark4

Illustration from Buckminster Fuller's book, "Synergetics".

hierarchy. What remains is the stand-alone unbound particle.

At the atomic platform, the electron is the outer ccw (thus negatively charged) polyhedron field, and the inner polyhedron is the cw (thus positively charged) nuclear polyhedron field. Because twisting and looping is how energy is incorporated into a FS, the electron will morph into a proton when its circuitry is twisted beyond its capacity. The beauty of the FS is that there is now a way to model exactly what is happening. Each quantum has a structural ramification. It is now possible to model what is happening at a scale we cannot see. FS deals with the same simple notions that physics deals with and provides the structural context in which these fundamental attributes of energy and mass can be understood, and does it all with only a loop by bending, twisting, linking, and knotting. All the forces in nature can be modeled with the simple loop, which will be the particular subject of Paper # 4.

What is significant is that the structural pattern in Fig. 29 is composed of three loops, as is the simple Structor in Fig. 19. These three loops are the three quarks of a nucleon. If the anti-matter loops were show the number of Quarks would double to six and all would fit happily together in the same particle domain. The quarks come in verities because they themselves are composites of Nadi/neutrinos and Actor/ photons. This model also accounts for the fact the quark is never seen as a form in its own right. If the proton is destroyed, such as in real and anti-proton collision, what are seen after all the decay processes are complete, are the electrons, and high-energy photons and neutrinos all of which are lower structural platforms.

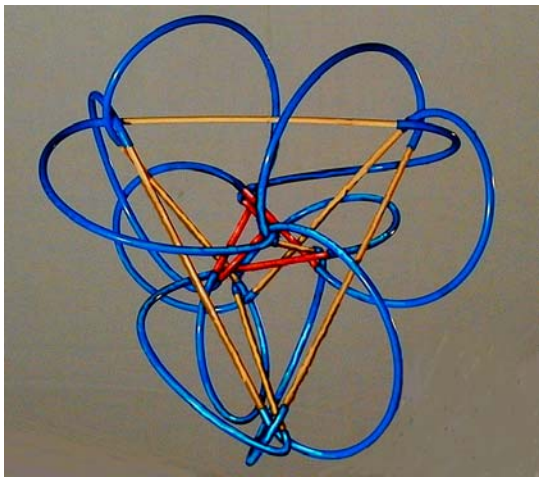

Fig.33: Tet-SuperStructor- vortex view, Cw positive nuclear field inside red and Ccw negative energetic field outside yellow. From this view inner Tet is centered.

Physics measures the mass value of the particle after it has been stripped from the hierarchy from when it evolved. When a proton is removed from the particle hierarchy to measure it, (the proton occurs naturally inside an atom) the contributory particles that have gone into its making are removed. This removal is results in a decay process that subtracts the bound mass values of the removed particles leaving the proton with the number we know to be its unbound mass value. In the PHC (Particle Hierarchy Chart) on page 24 the decays schemes of the first particle family are show with the loop being the unit of measure.

As mentioned earlier, mass in FST is a count of the number of loops, which is the number of full 360˚ rotations made by the line of action. Loops of a line and rotations of a line of action are communicable and functionally identical. Mass values are a count of loops while energy values are a count of the number of full twists on a loop. In the equation $E = mc^2$, FST considers the 'm' value to be the number of loops (or 360˚ rotations a line makes while looping through the structure), while the 'c' value is the same number as the mass number 'm' but squared. In other words, c is m, which is saying mass is a thing and the thing is in motion and the energy of its motion amounts to the m number multiplied by itself. That number is square because while the loop has been accounted for, the number of twists in that loop needs to be accounted for as well. This implies that there is a hard and fixed relationship between the number of loops and the number of twists. That is why the c is a number that does not change. Only m needs to change. The constant c will keep up with it automatically. No matter how simple or complex the FS, this ratio is constant, i.e., **the number of twist is the square of the number of loops**.

To make a Structor (ST) requires the loop number to be the square of the number of the twists in the loops. It is a physical requirement that in making a ST, the number of twists will be the square of the number of loops. Here we have a physical constant expressed by the geometry of the particle form. We know why the speed of light © is squared in Einstein's famous equation $E = mc^2$ but even more importantly, we can now know where the value of 'c' is coming from.

If this postulation is true, the SOL constant is a property of the geometry of a fieldstructure. Time is a count of circuits because the circuit is a unit of time. The important point to realize is that each particle is a structural entity comprised of an organization of action circuits. If you know the number of circuits of action (or the number of loops a circuit makes – same difference) and remember that a loop of action is a 360˚ bend of a line of action, and that a 360˚ twist of a line of action (loop) is tantamount to a 360˚ bend, then a count of the number of loops and twist of a line of action will give the total energy of the particle system. Since a unit of mass is a circuit, the circuit also becomes the basic unit of time. It follows that the speed of light (SOL) constant is merely stating

that the loop is a unit of space/time. Hence the 'c' is the same number as 'm' in the $E = mc^2$ equation. The fact 'c' is squared attests to the fact in tetrahedronal FS architecture the exoteric energy domain will be the square of the mass energy domain. The number of vortices in the polyhedron nuclear center of the FS is the square root of the number of the total number of vortices in the energy domain outside the polyhedron nucleus of the system. Simply put, a unit of mass is a unit of time. It seems that this rule applies only to the tetrahedronal family of particles, and not to the Octahedron or Icosahedron form families which are the resonance particles of the second and third particle generations and accounts for there instability and short life times.

Hence: $E=mc^2$ in relativistic physics is the same as $\mathbf{E=m^3}$ in FST, wherein *m* is the number of loops in the structure and m^2 is the number of 360˚ twist in the loops. Loops and twist are energetically equivalent. This hierarchy of mass and energy values forms a Sierpinski Fractal where each line represents a twist and each triangle a loop.

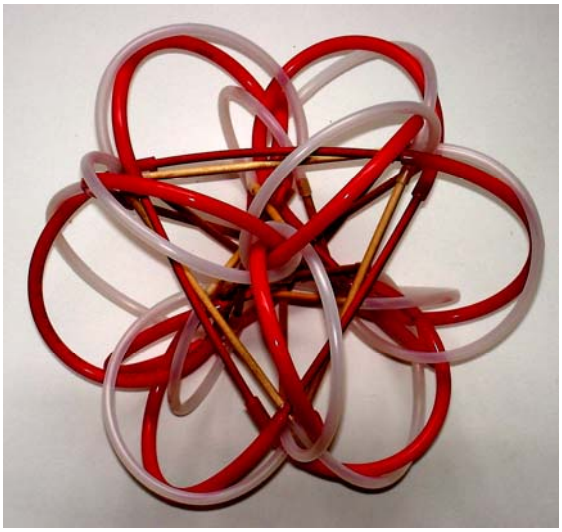

Fig. 35: Ambi Tet-SuperStructor:
Ccw (red) and Cw (white) circuitry sharing the same domain. Inner and outer tets are reversed handedness. Note: In this dual SuperStructor (SST), the inner Tet is centered from all views.

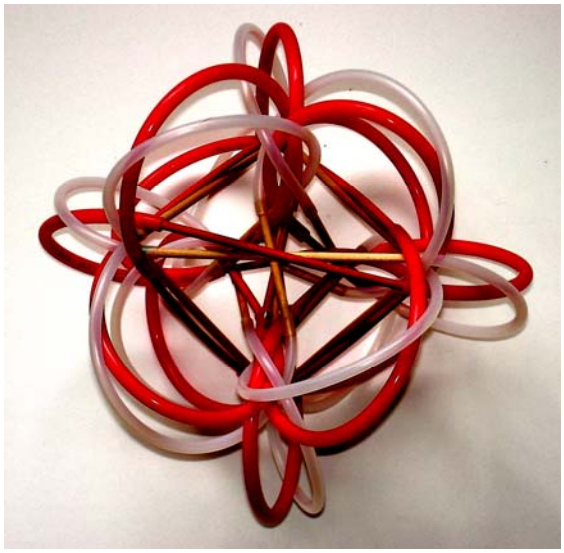

Fig. 34: Ambi Tet-SuperStructor:

Fig. 36: SuperStructor double Tet Cube

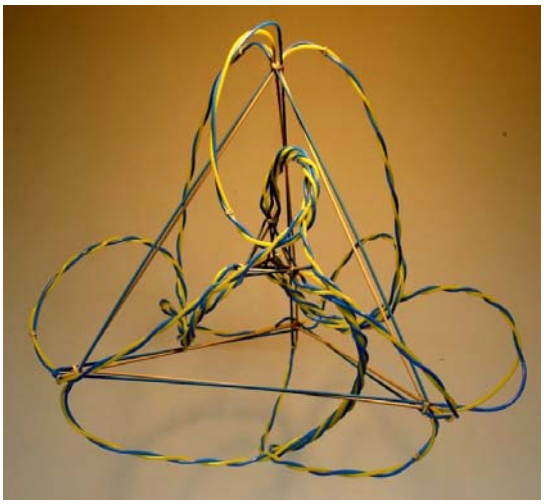

Fig. 37: Large SuperStructor
Inner tetrahedron nuclear polyhedra circuits to outer energy field tetrahedron allowing for multiple twist of energy. This structure shows how energy (twist) can be accommodated in structures at the scale of the atom.

PHC # 3
Working Document

he Absolute Action Matrix

Allowed # of ll twist	Outer loop Cw or Ccw	Boson or Ferm-ion	Spin #	Natural and/or Physical name of structure
1 to ?			1	Ether, Action Plenum, Torsion Field, among others
1 to ?			1	{Prakriti, Maha Shakti, Akasha (Vedic ref.)}
				basic minmum wave substratum
				By virture of being a loop, Prana requires chairality.

First Family of Fundamental Particles *("First Generation particles")*
Using Tetrahedron Architecture (three lines of action intersect at each vortex)

Field Order	# of Dimension nsi-	Name of field force	FS Name Cw=+, Ccw= - Both = *	# of loops mass #	Real+ or Anti-matter	Energy range Allowed # of full rotations	Outer loop Cw or Ccw	Boson or Ferm-ion	Spin #	Natural and/or Physical name of structure
1FO	-1	Gravity Field	Actor +	3	Both	$3>3^3$	Cw	B	1	radiant photon
			Actor -	3	Both	$3>3^3$	Ccw	B	1	radiant photon
			Ambi-Actor*	6	Both	$6>6^3$		B	1	bound photon (not possible to distinquish + or - rotation
			Nadi+	9	Anti	$9>9^3$	Cw	F	1/2	positron-Neutrino (anti-matter neutrino)
			Nadi-	9	Real	$9>9^3$	Ccw	F	1/2	electron-Neutrino (real-matter neutrino)
			Ambi Nadi +	27	Anti-	$27>27^3$	Cw	B	1	*NOTE: (Muon & tau neutrinos will be explained as 2nd*
			Ambi Nadi -	27	Real	$27>27^3$	Ccw	B	1	*and 3rd generation particle families respectively.)*
2FO	1	Electro-magnetic Field	Structor +	81	Anti-	$81>81^3$	Cw	F	1/2	Positron (9^2 = 81 = three Cw Nadi)
			Structor -	81	Real	$81>81^3$	Ccw	F	1/2	Electron (9^2 = 81 = three Ccw Nadi)
			Ambi-Structor+	243	Real	$243>243^3$	Cw	B	1	pion-meson+ (Π°) (243+27-6^+=264) ((264.2))
			Ambi-Structor-	243	Anti	$243>243^3$	Ccw	B	1	pi-meson- (Π-) (243$^-$+27$^-$-6^+=264) ((264.2))
3FO	2	Weak Field	Meson Structor+	729	Real	$729>729^3$	Cw	F	1/2	Kaon-meson (K°)= 729$^-$+243$^-$+2=974$^-$ ((974.3$^-$))
			Meson Structor-	729	Anti	$729>729^3$	Ccw	F	1/2	Kaon-meson (K°)= 729$^-$+243$^-$+2=974$^-$ ((974.3$^-$))
			Ambi-Meson-ST$^+$	1458	Real	$1458>1458^3$	Cw	B	1	meson+ (ETA)=1458-243-81-81+27-9+3=((1074))
			Ambi-Meson-ST$^-$	1458	Anti	$1458>1458^3$	Ccw	B	1	meson+ (ETA)=1458-243-81-81+27-9+3=((1074))
4FO	3	Strong Field	SuperStructor+	2187	Real	$2187>2187^3$	Cw	F	1/2	neutron = 2187-243-81-27 = 1836 (proton)
			SuperStructor-	2187	Anti	$2187>2187^3$	Ccw	F	1/2	neutron = 2187-243-81-27 = 1836 (proton)
			(Ambi-SuperStructor+)	4374	Real	$4374>4374^3$	Cw	B	1	Super heavy stable particle two times+proton
			– (Ambi-SuperStructor-)	4374	Anti	4374>43743	Ccw	B	1	Super heavy stable particle two times -proton

*

NOTES:
1 Light travels over the gravity field. Its job is to return action (energy) to the gravity field, which is the Action Matrix and from which action was gathered to make mass.

Working with the chart, the following is FST's explanation for why the proton has 1836 times the mass of the electron.

Particles are built incrementally in Field Orders. Field Orders is the concept that particles come in sets of a boson and a fermion couple. Actually they come in particle/anti-particle symmetrical sets of cw and ccw bosons and cw and ccw fermions. Bosons are the energetic particle inhabiting the energy field of a particle and fermions are the particles residing in the mass field of the particle (see page 14). To arrive at a mass value for each particle FST first considers the cumulative value and then to get the stand-alone value of a particular mass, subtracts the decay particle's PHC value to arrive at the stand-alone particle value. This is done because the particles are built from simpler particles.

The First Field Order (1FO) is comprised of a cw (pranum) and a ccw (prana) action loop. When three of these cw/ccw action loops interact, they produce a photon, which is the energy particle of the 2FO. When three of these energy photon particles interact, they produce the neutrino, which is the mass particle of the 2FO. When three 2FO sets interact they produce energy particle of the 3FO, the electron. When three electron 3FO interact, they produce the mass particle of the 3FO, the proton.

The photon, as a SOL wave, has no particle nature until it interacts with a mass. When light interacts with a mass and delivers its momentum to the mass, that energy is referred to as a photon. Until light interacts with a mass, it has no mass, no location, and no particle attribute.

A premise of FST is that each FO contributes its intrinsic energy to the next higher FO and also the extra energy needed (any amount greater than its intrinsic energy) to form the next higher FO. This is an important and crucial to understand how FST envisions the way nature builds. Nature builds platforms of structure by sharing energy through the system so that the least of particle input (the photon for instance) is integrated and structurally contributing the overall form. It does this by having each energetic input join a Field Structure as either a twist in the line of action (boson input) or an additional loop of action (fermion input). This results in the energy of a system being integrally shared throughout the form. In this way the energy is distributed in such a way that not only is the individual energy needs of the contributing particles persevered and maintained, but the collective needs of energy to sustain higher FO of complexity are also available without sacrificing the lesser needs of the contributing particles. The only structural model that can do this is the fieldstructure.

The process is similar to a real estate mortgage. The principle is the fixed energy requirements of the particle. The interest generated by the principle is available when combined with other inputs of principle to finance the construction of new particles and new higher order structures. A group of atoms with valance electron can make them available to produce molecules, the higher order organizations of atoms. In giving energy to form the higher order molecule, the individual atoms are not compromised. In fact the total net energy of the system is lessened giving up the unneeded energy as heat.

Converting PHC mass values to the stand-alone unbounded mass number of the proton.

2187 is the PHC mass value of the bound proton (see Particle Hierarchy Chart). To measure the proton by itself outside the hierarchy of

particles that are a part of the structure in a bound nucleus, it must be split out off from the nucleus. If this is done, a pion-meson is released having a PHC mass value of

-243 leaving a mass value of

1944 This particle having a mass value of 1944 decays by emitting an electron having a mass value of

-81 leaving a mass value of

1863 **The particle decays** one last time by emitting a neutrino having a mass value of

-27 When the neutrino leaves, the remaining value of

1836 is the known mass number for the unbounded proton measured in units. electron mass. Since the decay product of electron disintegration is gamma photon light means the mass of the electron has the same energy value as the kinetic energy (momentum) of a gamma photon. An electron is a bound photon. Physics has demonstrated that it is possible to create the electron from gamma photons.

In the PHC on the preceding page, the right-hand column of physical names shows the decay schemes for some particle, their PHC mass values and how they decay to reach their known physical values.

Fundamental fieldstructures come only in forms outlined in the paper. It is more than just accidental that these few fieldstructures match the particles found in nature. Never before has a structural geometry and particle physics matched up. The more I work with fieldstructures the more I am awed by the way geometry and nature replicate each other AND by how this is all done with but a few interacting factors applied to a single loop of action. The simplicity of the geometry of nature brings me joy and solace at the same time. My instincts tell me nature is simple once its structure is understood. I freely confess that fieldstructures have been medicine for my soul. I walk back and forth across the great divide between that which is physical and that which metaphysical with happy steps. Whodathunkit that the music of the spheres was made for dancing.

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