Some Principles and Discoveries of Observer Physics

by
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(Brief Summaries)

(Each item is subject to updates, refinements, revisions.)

(References to papers for details will be added.)

* **Science is an attempt to set in order the shared facts of experience.**
(OP, 0:1, 7.)

* **Physics is the scientific study of matter and energy and their interactions in space and time.** **(OP, 0)**

* **A Science of Consciousness:** Physics has moved from classical Newtonian ideas to Relativity and Quantum Mechanics. People are still trying to grasp these new advances, but now physics is already moving beyond these to explore consciousness, the unavoidable study of the relationship between an Observer's Mind and his World. The process of Observation not only affects the world, it defines the world. This is Observer Physics, a new emerging paradigm.
(OP, 0)

* **The Fundamental Principle of Observer Physics (Palmer's Principle)**: "I experience what I believe, unless I believe I won't, in which case I don't! Which means I did!" (Harry Palmer, **Living Deliberately**, p. 32. OP, 0)

* **Positive Paradoxes:** "This statement is a lie" is a self-referring statement that generates a paradox. The paradox causes the logical system to break down. Palmer's Paradox also is a self-referring statement that generates a paradox, but the logical system does not break down. It simply separates resistance to truth (pretense) from willingness to experience. It is a "positive" paradox that leads to deeper perspective. (OP, 5)

* **The Observer Defines the Universe.** Any Universe arises from a condition of Nothingness filled with All Possibilities. This is the essential nature of the Observer. The Primordial Observer designs a Universe to observe and participate in by defining a Set of Constant Relationships and a Scaling or Transformation Operator. What may occur in a given Universe depends on the

possible interactions of the defined Relationships with the fundamental Operator. (OP, 0)

* **Natural Laws are Beliefs that are held so firmly that they govern the world.** (OP, 0, 10:36)

* **Conservation of Undefined Awareness** – Undefined Awareness undergoes transformations but remains unchanged under any possible transformations. The other conservation laws of physics are subordinate expressions of this fundamental conservation law in terms of the constant relationships and operators that the Observer has defined. (OP, 10:37)

* **Conservation of Viewpoint**: A Viewpoint is a Belief created by an observer's definition of undefined awareness. Beliefs once created continue to exist as Realities created (defined) in the consciousness of the observer until experienced as created. Then they return to undefined awareness as possibilities. Viewpoint shifts made without experiencing prior viewpoints result in the prior viewpoints becoming abandoned viewpoints. Abandoned viewpoints continue to exist as Realities (the Observer recreates them over and over) in their respective viewpoint frames in the Observer's consciousness until the Observer experiences them as created. In other words an Observer defines his own Reality and keeps on defining it for himself over and over until he relaxes his definition (i.e., stops resisting it) and fully experiences it. Experience is the process of relaxing and enjoying a definition of Reality as just what it is – a Definition of Undefined Awareness chosen by an Observer to be exactly as originally intended by the Observer. (OP, 10:37)

* **Phase Conjugation** describes the fundamental coherent interaction of all wave-particle phenomena. It is a fully general way to describe phenomena, including consciousness, because all phenomena (including particles) can be described with waves. (OP, 10:6-10)

* **Mass Conjugation and Four-Particle Mixing** is phase conjugation adapted to particles. The gravitational tracking beam between a planet and a star is phase conjugated. The helium atom with four nucleons is the most perfectly balanced form of mass conjugation and four particle mixing. (OP, 10:6-10)

* **Mass, Energy, Time**, **Force**, and Related Concepts in our local shared Universe

are Always Observer Dependent and Observer Defined. They reflect Resistance on the part of the Observer as a Participant in his own defined Universe and have no independent reality. However, careful inspection reveals certain invariant quantities and relationships that hold for any given Universe. (Menzel, **Mathematical Physics**, Pt I, "Physical Dimensions and Fundamental Units.")

* **Constants of Geometry and Physics:** In our shared universe most scientists currently agree that a few properties are constant in Euclidean (default ground state) geometry: π, and its variations that define circles, spheres, and waves, as well as the properties of right triangles. In physics basic constants such as $\hbar$, c, e, G, and ε_0 reveal deep relationships among mass, time and length. (OP, 7:6)

* **Length (Size)** is also Observer Dependent and reflects the Viewpoint chosen by the Observer. (OP, 8:1-2)

* **Perception** itself depends upon the Observer's State of Awareness. Thus a study of how Observer Awareness generates consciousness and its various modes and states of perception is the foundation for any scientific inquiry. (OP, 6)

* **Attention Particles are antiphotons emitted by an observer. Light particles are photons emitted by an object that is observed.** Photons are anti-attention particles.

* **During interactions bosons stick together as boson-antiboson pairs phase-shifted by 180 degrees (opposite directions).** A boson pair represents a single boson reversing its direction in space-time. Under certain wave guide conditions photons can appear to split into "group" waves and "phase" waves. Group and phase waves are mutually orthogonal. Certain group waves can form wave ensembles called fermions (solid matter particles). Fermions scatter at various angles when they interact with bosons.

* **Gravity** is the tendency of a Universe with broken symmetry to return to its symmetry as a Unified Field. Gravity dominates at the smallest and largest scales of the universe and thereby links the forces. Gravity is produced by an observer when he creates something he desires and then abandons it without fully experiencing it. The material universe is the prime example. Gravity

links to electromagnetism via the gravitational constant.

$G = (\varepsilon_o)^{-1} (e\, \alpha / \varepsilon_o\, \pi\, b^3)^2 (Ss / As\, b) (\% / \pi\, b)^{.5} = 6.6712 \times 10^{-11}\ m^3 / kg\ s^2$

$G = (16 / 3\, \varepsilon o) (a\, \kappa\, e / b^3)^2$, where $\kappa = (4\, \pi\, \varepsilon o)^{-1}$.

The constant e indicates electric charge, ε_o is the electric permittivity of space, b and % are magnetic constants and adjust fractal scale in space. (*Ss*) is the volume of a sphere with radius b, and (*As*) is its area. This formula is the beginning of an electrogravitation unified field theory. It allows us to begin understanding gravitational interactions of masses in terms of electromagnetism. **The apparition of Coulomb's Law hiding inside the *G* constant is obvious from cursory inspection of the above formula.**

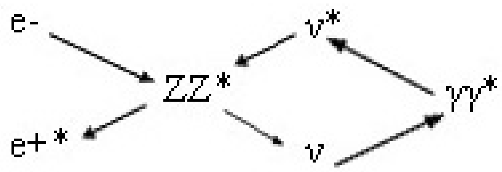
* **Electromagnetic interactions involve a photon-antiphoton gauge boson pair that scatters a fermion. The incoming and outgoing fermion forms a "pair" of particles.** This is fundamental four-particle mixing.

* **Weak interactions involve a pair of fermions interacting with a pair of WW* or ZZ* gauge bosons, except for the case of neutrino annihilation that is purely a photon-antiphoton interaction.**

* **Strong interactions are the "self" interactions of baryons and appear to be what hold nucleons together.** Strong interactions are superluminal space-like harmonic vibrations of a single fundamental vibration called the pro-neutron. The pro-neutron quantum energy multiples produce vibrations that cause a single nucleon to look like a cluster of nucleons. Thus the key to nuclear chemistry is the understanding and manipulation of the space-like harmonics. For example, the difference between lead and gold is a shift of a harmonic overtone. Fusion of hydrogen into helium with a subsequent release of energy is easily achievable by introduction of a proper vibration at a proper temperature.

* **Crystals and other chemical structures are space-like harmonics of atoms and molecules.**

* **All Subatomic Interactions** proceed by alternating boson pair, fermion pair, boson pair, fermion pair, . . . interactions. Thus each scattering node is always a **four-particle mixing**. Z bosons that mediate fermion pair creation or annihilation take pairs to or from neutrino pairs and then to or from gamma boson pairs at the start of creation or end of annihilation.



From left to right is an electron-positron annihilation event mediated by a ZZ* boson pair followed by a neutrino-antineutrino annihilation event that results in a photon-antiphoton pair that radiates off as gamma rays.

* **The Retrodirective Feature of Optical Phase Conjugate Mirrors (OPCMs)** makes them useful as auto-tracking devices. This property of phase conjugation shows up in gravitational systems. The earth and the sun (and any other celestial bodies) are linked gravitationally from their respective centers of mass. The sun "tracks" the earth wherever it wanders and maintains a focused gravity beam between them. The gravitational system has an additional feature not found in OPCMs. As long as the sun and earth do not change size or come under other influences, the gravitational phase conjugation maintains a stable pattern to their orbital motions. This feature derives from the conjugate property of gravity which is kinetic motion. KINESIS and GRAVITY are the conjugate properties of all physical objects from subatomic particles to galaxies. However, at certain scales the electromagnetic interactions swamp the gravitational interactions. The crossover regions between gravitational dominance and electromagnetic dominance are begging for closer inspection. Amazing wonders lurk there. One of them is the Planck Mass, or *Bu* particle as I call it. This mass is commonly studied in the laboratory under the guise of the Millikan Oil Drop Experiment. Using OPC mathematical models to study gravitational systems may be fruitful.

* **Two-Body Gravitational Interactions** can be described using phase conjugation methods. The study of conic sections and their directrices is also helpful for understanding gravitational interactions between two bodies. From this it is clear that gravity is bipolar. Ellipses all have two foci. One is gravitational and the other is kinetic. In a binary star system it is clear that each star has a kinetic pole and they share a gravitational pole.

* **Antigravity is Kinetic Energy**. Heat increases antigravity (decreases gravity) and leads to expansion of a system. Loss of heat decreases antigravity (increases gravity) and leads to contraction of a system. Entropy is antigravity. Gravity is anti-entropy.

* **Work is Entropy** viewed from an observer's biased (local) viewpoint. Entropy is work viewed from an observer's unbiased (nonlocal) viewpoint.

* **Galactic Rotational Curves Explained by Observer Physics**: Newton's Gravitation Law describes the Keplerian decline seen in the rotation curves for individual satellites in a solar system or a lunar system. To adapt Newton's law to describe galactic rotation curves requires that we account for a shift in observer viewpoint by reversing the sign of a component in the equation. This flips the curve over so that it nicely fits the general shape of galactic rotation curves. In the case of a solar system the satellite is viewed as being outside the physical structure of the gravitational well (i.e., the central star). In the case of a galaxy an individual star is viewed as being inside the physical structure of the gravitational well (i.e., the galaxy). Inside a galaxy a star is subject to gravitational pulls in opposing directions that tend to cancel out depending on the relative location of the star in the system. This strongly affects its velocity relative to its radial distance from the center of the galaxy. In a solar system these effects are only minor perturbations among the planets whose masses are puny compared to that of the central star that they orbit from a distance. An object at the center of mass of a star or galaxy feels only antigravity and has negative weight.

* **Gravity is a Reflection of a Desire among abandoned attention particles to return to their original unified condition. Kinetic momentum and Pauli exclusion delay this return. The original Desire arises when the observer exercises will to bias undefined awareness (thus breaking its unified symmetry) for some reason that seems reasonable at the time. Gravity disappears when the observer relinquishes his insistence on that fundamental bias and thereby recovers his abandoned attention particles. Momentum and exclusion then disappear from his viewpoint. Other forces work in similar fashion.**

* **Motion: The Einstein de Broglie Velocity Equation** shows that there is no particular speed limit for phenomena, but that light has a characteristic velocity relative to which matter (group) waves generally go slower (Vg) and phase waves generally go faster (Vp). The phase waves linked to information-bearing material waves via the constant speed of light also carry the same information but in a different mode. The basic relationship is (Vg) (Vp) = c^2.

* **The Relationship Between Matter Waves and Phase Waves involves a viewpoint shift of ninety degrees plus a shift from local viewpoint to non-local viewpoint.** We can also say that matter waves are serial, and phase waves are parallel. A matter wave moves like a particle in a trajectory. A phase wave moves like a line or a plane sweeping through space. Matter waves are time-like, and phase waves are space-like. Talking to someone is communicating by matter waves. The message arrives slowly word by word via sound (matter) waves in air. Looking at a picture is communicating by phase waves that form images with light. The message arrives on a single wave front all at once, but the observer needs a wide enough angle of view to see the whole picture in a glance. The wave front of the phase wave travels at light speed. But the phase interaction has no speed limit. The Mőssbauer Effect is an interesting example demonstrating a shift from local to non-local viewpoint. When an atom releases a photon, the atom recoils and thus is not able to resonate with itself and reabsorb the photon. Emitted photons ordinarily can create phonons but no resonant absorptions within the lattice. However, if the crystal is cooled down to the temperature of liquid helium the lattice vibration chills out and the crystal gains in "stiffness" and begins to function as a single quantum particle with a macroscopic mass. When an atom in the lattice emits a photon, the recoil gets spread to the mass of the whole crystal. The average amount of recoil for the emitting atom and its fellow atoms in the lattice is diluted below the quantum level that prohibits absorption. Thus any appropriate atom in the lattice may absorb the emitted photon. The viewpoint for information processing shifts from a single atom in the crystal to the whole crystal. The sensitivity of this effect has led to a whole new technology of Mőssbauer spectroscopy. In general when you lower the level of a system's excitation, the "viewpoint" tends to shift from local to non-local. Low temperature physics provides many amazing examples of macroscopic (non-local) quantum effects. The non-local EPR effect is another example. High level managers understand this principle and therefore have very cool heads. Buddhas and other enlightened yogis use this same principle to manage entire universes.

* **Quantum Spin and Gyroscopes.** The subject of quantum spin is very arcane and counterintuitive for most people. This is partly because physics texts usually do not explain ordinary tops and gyroscopes clearly. When an object starts to spin, it creates a standing phase wave that is orthogonal to the direction

of spin. We call that the axis of spin. In the absence of secondary forces (such as gravity) this axis is stationary and has no preference for up or down. Which way the top spins will depend on the observer's point of view. Spin a top on a glass table. Looking down at it from above you see it spin one direction. Looking up from under the table, you see it spin in the opposite direction. The top spins 50% one way and 50% the other way. The axis is half up and half down. If the axis is rotated by gravity or some other force, it will precess in the direction of spin. If many tops are randomly set spinning on a table top, half will spin clockwise, and half will spin counterclockwise. The difference between tops and electrons is that the electron does not actually spin but only appears to. (Also it does not stop spinning!) Photons spiral out from the singularity point at the core of the electron and give the illusion of spin. Unlike ordinary tops, quantum tops have a fixed spin because the speed of photons is constant at the event horizon of a subatomic particle. The rotation is 720 degrees instead of 360 degrees because the photons move in pairs with opposite spin. As the photon dominates, the electron pole seems to spin one way. As the antiphoton dominates, the pole flips and seems to spin the other way. Thus an electron has a kind of primordial alternating current.

* **The Secret of "Quantum" Spin. All spin (macroscopic or microscopic) is quantized**. Fermions (quarks and leptons) have spin 1/2. What does that mean? To understand it you must experience it. Almost everyone experiences identification with a body (the viewpoint of broken symmetry). The body functions as a fermion. From a standing position slowly rotate in a clockwise direction. You experience that as your body turns clockwise, the room (and the whole rest of the universe) turns counter-clockwise. You think the room is "not you" (forget the rest of the universe!), but it is your other half. Thus, when you put attention on a spinning body as an isolated local particle, you only see half the spin. The other half is the environment. The gauge bosons do not have that split. They move at light speed, which is the ground state for motion, and are field effects. Their "rotation" is a perturbation of the field. The whole thing moves internally without going anywhere, so we add the two halves to form a unity. The photon carries the environment's spin that comes from all around and seems to go around the "spinning" observer, and the antiphoton carries the observer's attention spin (that sweeps or scans the environment). The two are an integrated wholeness. Depending on viewpoint photon spin is thus +1, -1, or 0. Antiquarks and antileptons each have opposite spin (-1/2) and are separate localized eddies like quarks and leptons (+1/2). In particle

ensembles such as baryons, mesons, atoms, and molecules, we add the spins to determine the boson or fermion nature of the ensemble. Baryons are made from three quarks and a bunch of leptons. The leptons in ensembles (e.g. electron and antineutrino) are always in pairs that cancel the spin. Two quarks and an antiquark produce a resultant of +1/2. Two antiquarks and a quark produce a spin -1/2. Three quarks give a spin of +3/2. Three antiquarks give a spin of -3/2. Mesons are made from a quark and an antiquark, so the total spin is 0. That's it. The only weirdness is the gauge boson spin because most people are used to the fermion viewpoint. Ordinary bosons are actually quasi-bosons because they imitate the gauge boson by having a balanced whole integer spin value of 1 or 0. The gauge boson is a field effect. To experience it you must practice rotating and then integrate the two halves of your spin into a single wholeness. This is the secret of the Sufi whirling dervishes. By reintegrating their quantum spin values they shift from a particle viewpoint to a field viewpoint. That takes them beyond space and time.

* **Graviton Spin:** Physicists say there is a particle they call a graviton that has a spin of 2, but they have not actually observed such a particle to date. Observer Physics obtains the value of 2 by noting that a gravitational effect requires two fermions to interact exchanging a gauge boson. The gauge boson has spin +1 and the two fermions each have spin +1/2. The total is +2. There is also a -2 condition and a 0 spin condition where everything balances out.

* **The Higgs Boson:** Photons have no mass, but other particles have mass. Standard Field Theory produces only particles without mass. To get mass for the particles physicists imagine a Higgs field that interacts with the vacuum field. The field must have a Higgs Boson particle aspect. Thus far it has not been observed conclusively although some experiments claim hints at it. Observer Physics suggests that mass comes from the Observer's resistance to his creations and is not inherent in them. The experimental evidence that supports this is the easily validated truth that you can not detect mass in an object without resisting it in some way. Thus the "Higgs Field" is a firmly held belief by an Observer that certain things have mass. As a result those things dutifully exhibit a characteristic mass every time the Observer resists them. Nobody bothers to notice how they do not exhibit mass when the Observer stops resisting them. Experiment: Go watch a "real" car or a car on TV. Then get behind a car and push it or (try to) lift it. (Be careful not to strain.) What is the difference between watching a car and pushing a car?

Observer Physics proposes that the real "Higgs" particle is the *Bu* Boson Planck Mass with its relatively very large mass for a fundamental particle of 1.86x10^-9 kg. Any smaller "Higgs" will be an "undertone" echo of that particle. Free *Bu*'s seem extinct from our spaced out viewpoint, but live on as the unseen precursors of protons and neutrons. We can study them by probing protons and neutrons. (See also "**Rules for Creating Universes**" appended to this list of summaries to see mathematically how an Observer introduces mass by choosing a certain viewpoint in an empty field.)

* **Primitive Undefined Notions**: All systems of knowledge have at least three primitive undefined notions. We can assign them any labels we like and build from there. One of them is always the Observer, or Subject. The pure observer is unknown and undefined. The other two labels define his world. One of the two is a dynamic operator, the Will; the other is passive and accepts. But they are really undefined, although we can build imaginative models with them.

Examples: Existence, State, Change
Awareness, Boundary, Cancel.
(Cancel is the Awarenes Operator.for setting Boundaries)
Observer, Observed, Observation
(Observation is the Observer Operator
Observer, Point, Space
(Space, Neighborhood, or Gap, is the Observer Operator)
Relaxation, Focus, Attitude (suggested by Harry Palmer)
(Relaxation is Awareness, Attitude sets Focus for Relax.)
(Make up your own labels and play with them.)

* **The Observer Ground State is a Unified Coexistence of All Possible Conditions.** All systems defined by an Observer tend to return to the Observer Ground State. Entropy is the tendency of a system to relax back to its Observer Ground State.

* **Discovery of the Conventional "Rest Mass" of the Proton expressed in terms of Universal Constants of Physics.**

$Mp = \pi\, b\, e / c$. (See next discovery for definition of *b*.)

$Mp = \alpha\, b\, \Phi_o / \kappa$

$Mp\, c^3 = \pi\, (e / \varepsilon_o)\, (b / \mu_o)$

$Ep\, c = \pi\, (e / \varepsilon_o)\, (b / \mu_o)$ [$Ep = Mp\, c^2$.]

* **Discovery of a Constant Length (*b*) Associated with the Proton**. The above equations contain only standard constants of physics and math except for *b*. Therefore *b* must be a constant and equals 1 meter. There is a tiny discrepancy between this formula and the experimental value. This is handled by a factor based on the Scaling Operator (%), which is discussed below. The proton mass varies according to its state. For example, the neutron state is heavier.

* **Alternate Derivation of Nuclear Magneton**

$\mu_N = \hbar c / Oo$

This version also shows the constant *b*; *Oo* is the circumference of a circle with a radius of *b*.

* **(Square Root of 10) Meters is a Scaling Operator.** The diagonal of a 1x1 meter unit square is (square root of 2) meters. The diagonal of a 1x2 meter rectangle is (square root of 5) meters. The diagonal of a 1x3 meter rectangle is (square root of 10) meters, or (square root of 2 times square root of 5) meters, or 3.16227766. . . meters. The ratio of the diagonal to the short side (which has length *b*) is the pure number 3.16227766. . . . We use the symbol % for the length of the diagonal and <u>%</u> for the pure number ratio (% / *b*), the ratio of the diagonal to the side of the 1x3 meter rectangle. The value (%) occurs very frequently at various scales in modern physics, suggesting that it plays a role as a Scaling Operator. For example, ($\hbar$ *c*) / (%) = (b/%)^52 Joules.

* **The Fundamental Quantum Factor (FQF) is a constant from geometry times the ratio of the charge quantum (*e*) squared to the permittivity of the vacuum (ε_o) times the ratio of the Scaling Operator to the Unit Radius.**

$(\pi \% / \varepsilon_o b) (\pi e Ss / As b)^2 = \hbar c$

$\alpha = e^2 / (4\pi\varepsilon_o \hbar c)$.

Thus whole expression boils down to:

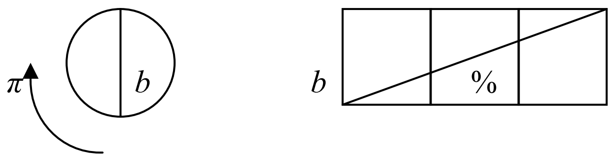
$(\pi^4)(Ss^2 \% / Ao As b^3) \alpha = 1$

$[(\pi^2)(2/3)]^2 (\% / b) \alpha = 1$.

(*Ss*) is the volume of a sphere with radius (*b*), (*As*) is its area, and (*Ao*) is the area of a circle with radius (*b*), and (α) is the fine structure constant. Thus, by means of the Scaling Factor and Unit Radius, we have alpha in terms of physics and in terms of geometry.

* **The pure number Scaling Operator Ratio (SOR) (<u>%</u>) and pi are so close**

that they tend to interact a lot. The scaling operator is the diagonal of a 1x3 square. Pi is the ratio of a circle's circumference to its diameter. They are analogous ratios, one as a straight line and the other as a curve. They may be the closest these two modalities come to meeting. Diagonals of shorter rectangles approach (*b*) as a limit, and longer diagonals approach the rectangle's long side as a limit. So (%) is something like the real world Fibonacci for phi. You can make a pi rectangle, but it is irrational. It has a length of 8.86960440052.... meters. You can not make an integer number of squares from a 1x8.86960440052 rectangle.



The ratio (% / π b) = 1.006584242.... is probably the simplest scale adjustor between the world of circles and the world of squares – something we always face doing measurements.

* **List of inverse powers (roots) of (% / π b).**

00	1/1 =	1.00658424209
01	1/2 =	1.00328671978
02	1/4 =	1.00164201178
03	1/8 =	1.00082066914
04	1/16 =	1.00041025041
05	1/32 =	1.00020510417
06	1/64 =	1.00010254682
07	1/128 =	1.00005127209
08	1/256 =	1.00002563571
09	1/512 =	1.00001281777
10	1/1024 =	1.00000640886
11	1/2048 =	1.00000320442
12	1/4096 =	1.00000160220
13	1/8192 =	1.00000080109
14	1/16384 =	1.00000040054
15	1/32768 =	1.00000020026
16	1/65536 =	1.00000010012

* **Derivation of Conventional "Rest Mass" of the Electron**

$Me = \hbar / a_o \alpha c$

$Me = (\pi e b / c) (\pi^2 \alpha b^6 / \%^3 Ss)$

The electron mass differs from the proton mass by a proportion of slightly over 1836. Note that (Ss) = (4/3)(πb^3) and %^2 = 10 m^2. The above formula gives 9.12884837451x10^-31 kg. We adjust that as close as we like to the standard we prefer by dividing this by an infinite sequence of the roots of (% / π *b*). In this case the sequence beginning with the 4th, 16th, 128th, 256th, and 1024th roots adjusts it to 9.10938684976x10^-31 kg. Space, time, and mass are quasi-fractal, so the exact value we get for any measurement depends on how and why and from what viewpoint we measure it. The accuracy of the above sequence is also influenced by the resolution of my digital calculator. I do not trust the accuracy of numbers taken past 5 or 6 decimal places since my machine only handles 12 digit numbers. How these sequences work is an interesting question.

* **Theoretical Mass and "Rest Energy" of the Electron Neutrino (*Mve*).**

$Mve = \hbar / \% c$

$(Mve\ c^2)(\%) = \hbar c$

* **The Planck Mass, or Unity Boson** (*Bu*) approximately equals 1.86x10^-9 kg.

$Bu^2 = \kappa e^2 / G$

$Bu^2 = (\hbar c \alpha) / G$

$Bu^2 = Ss / \pi \kappa^2 \varepsilon_o$

Here (κ) is the Coulomb Constant, (*G*) is the Gravitational Constant, and (*Ss*) is the volume of a sphere with radius (*b*). The first version is derived from an analysis of the Millikan oil drop experiment that determined the quantum of Elementary Electrical Charge. The second formula is derived from examining the behavior of gravity in black hole conditions. It is also exactly equivalent to the first formula: hence, (κe^2) = ($\hbar c \alpha$). We know that neutrinos interact in the physical world mostly via gravity because they lack charge. Compare the black hole formula with the theoretical electron neutrino mass given above. Within the next few years ongoing experiments should narrow in on the mass of the electron neutrino. Then we will be able to determine with more certainty the value of the smallest quantum of energy that can manifest as mass. The third version is derived from a study of the Vacuum Permittivity Constant. The Planck Mass is the seed from which the stable baryon (proton-neutron oscillator) arises. It thus gives birth to our physical universe.

* **The Three Fundamental Particles in Terms of the Planck Mass**.

$Mve = Bu^2 \, (G / c^2 \, \% \, \alpha)$

$Me = Bu^2 \, (G \, \varepsilon_o \, \% \, \alpha / c \, e)$

$Mp = Bu^2 \, (G \, \pi \, b^2 / \kappa \, c \, e \, \%)$

* **The fundamental constants of physics are quasi-fractal based on the interaction of quantum charge pairs (e^2) and the constant $\kappa = (4 \pi \varepsilon_o)^{-1}$.**

$\alpha = (\kappa \, e^2 / \hbar \, c)$

$Mp = (\alpha \, b \, \Phi o / \kappa)$

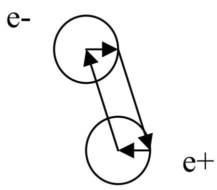
$Me = (\hbar / a_o \, \alpha \, c)$

$G = (\kappa \, e^2) \, (Ss^2 / \pi \, As \, b^4)$

Notice that the gravitational constant is electromagnetic in nature. Thus gravity mimics electromagnetic forces, and electromagnetic forces mimic gravity. The only difference is scale.

* **The Structure of Electrons**: Electrons arise from the vacuum as excited photon states that form electron-positron pairs. When positrons become trapped inside proton-neutrons, electrons are locked into an energy loop analogous to a superconducting electrical circuit in a wire. (The same happens for muons and antimuons, but free muons decay rapidly.) Photons flow backwards in time in a spiral into the singularity of the positron and tunnel to the singularity of the electron. They then spiral forward in time and outward from the electron singularity to the de Broglie radius that defines the event horizon. From there they radiate across free space to the event horizon of a positron and spiral inward to its singularity, reversing their direction in time when they cross the event horizon.

"Forward" Direction of Time: ---> (Circles schematically represent spirals)



The photon spiral path is analogous to cyclotron behavior. The photon inside an electron has a characteristic "cyclotron" frequency. As it nears the singularity it undergoes a shift in wavelength due to refraction and a wave guide effect due to self-interaction. This is analogous to the relativistic shifts of particles at high speeds. All photons are clones of a single Ur-photon that vibrates as a superluminal phase wave in Observer Awareness due to definitions "believed in" by the Observer. In our Universe we apparently believe that all photons obey the Einstein-de Broglie Velocity Relation when they self-interact. This is a generalized phi relationship. The spontaneous emission and absorption of virtual photons (and even virtual electrons) by electrons is due to the linear momentum of the photons. The photons perturb the electron and create the illusion that it emits and absorbs them because of its rapid jiggling of position.

* **Antimatter hides inside Matter.** A key principle of Observer Physics is that the "missing" antimatter is all hidden inside nucleons. If mesons can be made from a quark and an antiquark, why aren't baryons made in the same way? We only have to account for the stability of protons. You can demonstrate the principle by running water from a tap into a sink. Let the water build up until the sink is about half full. Then get a balance between inflow and outflow. The drain will form a vortex hole that represents an antielectron. The tap represents the electron. The water down the drain recycles as rain back into the water tank and on to the tap. The water in the sink represents the quark buffer that creates an environment for the antielectron. Modern electronic wizards are learning to create and manipulate such antielectron "holes" within circuits as if they are actual particles of antimatter. The study of "hole" circuits is an exciting new field that is rapidly evolving.

* **Pair Production and the Planck Length.** It is very possible that pair production of various subatomic particles can provide a mechanism for studying the Planck length. The theory of Observer Physics is that pairs emerge from the Vacuum State connected by a tiny bubble with an initial radius of about 10^-35 m. This is the quantum unit of distance (Planck length), the smallest distance that can occur within the physical space of our Universe.

* **The Structure of the Pro[ton]-Neutron.** This particle is an ensemble that can be analyzed in several ways. Fundamentally it consists of three major interacting components with several smaller components that act as gateways for photon flow.

Analysis #1. The "Product" of Interacting Planck Masses.

(*Bu*) (*Bu*) (<u>*Bu*</u>) = (1.86x10^-9 kg)^2 (1.93x10^-9 kg^-1) = He. The (*Bu*) stands for an up quark, and the (<u>*Bu*</u>) stands for an antidown quark. The down quark is made of antimatter and approximately cancels the mass of one up quark. But the **product** of the interaction comes to four hydrogen atoms or one helium atom. Helium is the ground state atom. Diatomic hydrogen gas is its temporary intermediate state because inflation during the Big Bang cooled the primordial gas too fast for helium to condense out and most of it got stuck in hydrogen mode. So it gradually condenses in stars through hot fusion. Hydrogen will also condense into Helium during a cold fusion process, but it needs to be cooled to near absolute zero and then brought into phase conjugation. Helium is a set of four neutrons phase conjugated in four-particle mixing.

Analysis # 2: A Mini Black Hole Pair with Hawking Radiation

Two (Bu) Planck Masses (up quarks) swallow each other. Where they overlap forms the Anti-Planck Mass, which is an antidown quark. If we treat the down quark as a real mass, it forms a "virtual" black hole in the vacuum with a mass of close to 10^9 kg. Such a black hole reaches an internal temperature of around 10^14 K, which is sufficient to radiate (and eat) protons and neutrons as well as lighter particles such as pions, electrons, and photons. The protons and neutrons are continually swallowed and emitted at high speed so that the result appears to be a particle vibrating. The ground state of its vibration pattern is an atom of helium. A preliminary view of the neutron ensemble is that it contains three quarks, two electrons, two positrons, two electron neutrinos, and two electron antineutrinos. When the ensemble relaxes an electron and an electron antineutrino pop out of the event horizon. The electron tends to enter a ground state orbit and the antineutrino carries off momentum. These two particles satisfy the Heisenberg uncertainty requirements.

Analysis #3: A Pion Ensemble

Protons are surrounded by a cloud of virtual pions. This suggests that the proton itself may be made of pions, an analysis superior to the quark-electron theory because the masses of all the component particles of the ensemble nicely add up to the mass of the pro-neutron baryon. (Here we treat the components as separate particles.) The neutron ensemble consists of a positive pion, a negative pion, and a neutral pion playing the roles that physicists think of as the quarks. Each pion consists of a quark-antiquark pair. The four quarks primarily involved are up, antiup, down, and antidown. These have 12 possible quark-mixing transformations, 8 with one substitution, and 4 with two substitutions. Calculating the probabilities gives the proper mass of the neutron. Up quarks have no charge and are essentially fat neutrinos in a bound state. If freed they quickly decay. Down quarks are negative, and antidown quarks are positive. The quarks in the pions are constantly mixing and decaying and antidecaying so the mix contains an average of three antimuons, two muons, and an electron plus the corresponding neutrinos and antineutrinos in addition to the three resultant pions. The neutral pion sits in the middle and shares the antimuons of the charged pions. The component particles treated as such add up to the total mass of the neutron. The neutron beta decay results in loss of the electron and an antineutrino and converts the neutron into a proton with a positive charge.

* **Infinite means that something is undefined, not that it is endlessly huge or numerous.** This clarification resolves a lot of the weirdness in math associated with the study of "infinite" sets. For example, consider the notion that 1 infinite set plus 1 infinite set still equals 1 infinite set. If you have a box with an undetermined number of widgets and add to it another box containing an undetermined number of widgets, you still have a box with an undetermined number of widgets. An infinite set plus (or minus) any finite set is still an infinite set. Add 5 widgets to a box with an unknown number of widgets. How many do you end up with? You still don't know. Have you ever overdrawn your checking account because you lost track of what was in it? Did the bank ding you because you were infinitely rich with endless piles of dough? An infinite set minus the same infinite set (**not a subset!**) is zero. Try dumping all the widgets out of your questionable box or closing your questionable checking account. How many widgets or dollars are left in the box or the account? It is simple Observer Physics.

* **Irrational Numbers are Countable -- if and only if the Observer defines them.** Irrational numbers correspond to the gaps between rational numbers. These gaps are required to obtain continuity from a set of real numbers. The size-less points on a line segment correspond to the real numbers, so the irrational numbers correspond to "gaps" between points, and the points correspond to rational numbers. For example, the Observer may choose any specific natural number n, as large as he likes, and define that as the greatest upper bound of his counting system. That becomes the standard denominator for rational numbers. He may then list all rational numbers in a proper ordinal sequence from 0 to n using the natural numbers from 0 to nxn or even beyond as far as he wishes to define as the numerators for each rational number. (Negative integers and rationals are obtained by reversing the sign of the numerator from positive to negative.) The numerators of these rational numbers also serve to count all the "irrational" gaps between the rational

numbers. The gaps are irrational by definition. If the Observer also assigns a standard displacement in physical space to represent each gap, his system will also serve as a standard ruler. For example, if n = 10, nxn is 100 = b, he will have a meter stick divided into centimeters. If he sets the numerator range that nxnxn is 1000 = b, then his meter stick will be graduated in millimeters. If a mathematician refuses to define an upper bound for his number system, then the numbers in his system (even the natural numbers) by definition are uncountable. The non-algebraic irrational numbers can not even be written down or represented by any symbolic algorithm. (Note: The inseparable quantum relations between energy and time, momentum and space, causes relativistic distortion of any metric at extremely small and extremely large scales of spatial resolution in the observation of the physical world. The tools for measurement, including the human body, also influence obtainable results in measurement.)

* **Connecting the Dots Reverses the Collapse of the Quantum Wave Function**. This children's game provides insights into quantum physics and how the mind works. Make a series of dots on a sheet of paper and practice mentally connecting them to form a line and then mentally disconnecting them to form a series of dots. You are doing quantum physics. Connecting the dots creates a phase wave. Disconnecting the dots creates a set of group waves. Place the paper just at the edge of a table and cover it with a book. Pull the paper out from under the book so the dots appear one at a time. This is group wave technology. Remove the book and look down at the paper from above so you can see all the dots at once forming a nice line. That is phase wave technology.

* **The Mirror of Predictability and Uncertainty:** Numbers are the most precise thoughts in the mind. The mind finds particle numbers (natural numbers, integers and rational numbers) predictable and precise in value, but finds irrational numbers unpredictable and imprecise in value. In the physical world quantized particles are unpredictable and continuous (quantum wave) functions are predictable. This mirror-like inversion belies the apparent precise mapping between math and physics and confuses people with regard to the nature of the real world. They put trust in money, apples, houses and things that are here today and gone tomorrow as if they were certain and would stay put. Only the continuous flows of dynamic archetypes and core belief patterns (wave functions of life) are reliable over long stretches of spacetime. Ordinary mirrors reverse space, conjugate mirrors reverse time, and mental mirrors reverse predictability. Play with mirrors in terms of desire and resistance and

see what happens to mass and gravity.

* **Bubble Harmonics**: Observer Physics proposes the theory that atomic nuclei are complex energy bubbles and not made from many individual particles. The baryons vibrate rapidly back and forth and create the illusion of complex heavy nuclei. This approach may eliminate the need for Quantum Chromo-Dynamics (QCD) as well as lead to many new technologies.

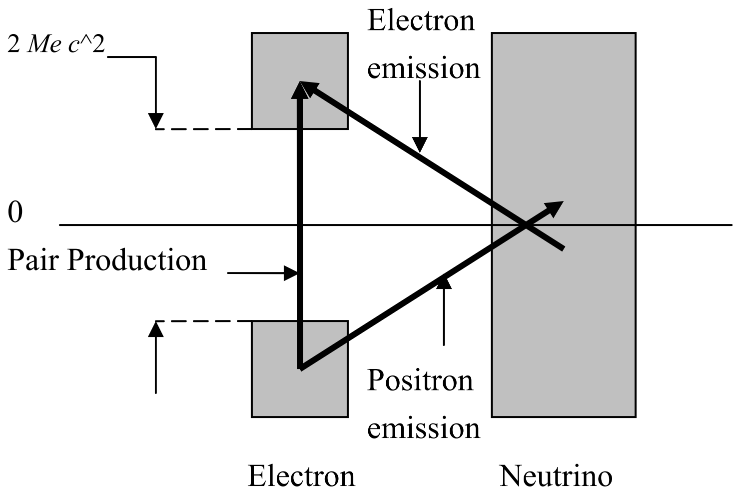
* **Observer Physics and Cold Fusion**: Based on the theories about the structure of matter proposed in Observer Physics it seems that controlled fusion may be achieved much more easily by cooling hydrogen or deuterium close to Absolute Zero temperature. Cooling by 270 K is much easier than heating by 15,000 K. At close to Absolute Zero all entropy leaves the system and it becomes super orderly and extremely compact. If super-cooled below absolute zero to a negative temperature, it will tend to find its true ground state, helium. The relative positions of the molecules can be aligned and then shifted into the perfect phase conjugated liquid helium mode by applying the proper harmonic vibration.

* **Neutrino Helicity and Consciousness**: **The curious situation that neutrinos all seem to be left-handed is a tell-tale symptom of the original split between mind and matter, the first breaking of symmetry when gravity separated from the other forces.** Photons are considered gauge bosons with spin one, but actually are made of two photons of opposite spin stuck together: a photon and an antiphoton. The W and Z bosons also only appear in pairs. They have spin 1 because they are really gauge fields and not separate local particles. When photons curl up to form leptons and baryons, they become localized particles and thus have only spin 1/2. This is because the antiphoton flow that makes them up becomes a stream of attention particles and forms the wakefulness and thoughts that we call consciousness. The neutrinos are the most primitive of the spin 1/2 particles. Free neutrinos have too little rest mass and are too dispersed in space to hold a charge. Just as the background radiation records the Big Flash, the helicity bias of the neutrinos records the breaking of symmetry when gravity separated from the other forces. The apparent loss of "handedness" in particles as they increase in mass and complexity is analogous to the way time quantum reversibility in physics is lost as subatomic particle systems become statistically huge. The statistical systems wash out T invariance and start the illusion of entropy. From the

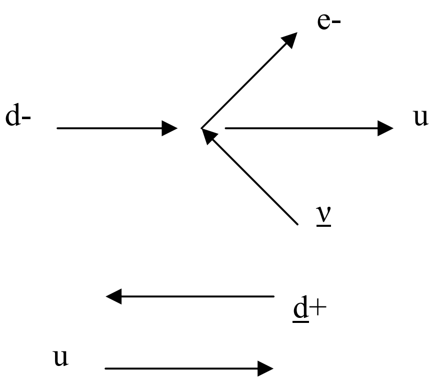
electron on up the scale electromagnetic and gravitational tidal forces swamp the original helicity preference. Only the neutrinos are small enough and uninvolved enough to retain this memory of the Big Split that occurred an instant after the Big Bang. By studying neutrinos we have a low-energy window directly back to the original breaking of symmetry at less than 10^-42 seconds after the Big Bang.

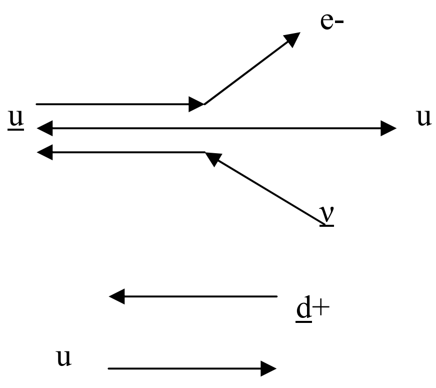
* **Neutrino Helicity and Charge: The fact that neutrinos have helicity bias and spin only one way as a particle and one way as an antiparticle is the reason that, although they generally behave like fermions, they have no charge.** The basic distribution of charge among the particles is as follows. (1) Contrary to Standard Theory **all bosons** lack charge. They simply mediate the exchange of energy between fermions and pass along whatever charge is present among them. (2) **All neutrinos** also have no charge although they behave as fermions. (3) According to current Observer Physics theory **up and charmed quarks** are heavy bound neutrinos, so they do not have charge either. (4) **All other leptons and quarks have charge.** (5) Conventionally all charged particles are treated as "negative", and all charged antiparticles are treated as "positive". Thus a baryon or meson particle ensemble with positive charge contains a net excess of at least one charged antiparticle. (6) Non-living particle ensembles (such as atoms and molecules) can have net quantum spins that give them boson qualities. They can also exhibit collective charge orientation. (7) **Conscious living organisms** generally do not exhibit macroscopic spin. Their bodies and conscious thoughts behave like fermions, but their deeper level of consciousness is a quasi-boson. They reflect the property of neutrinos on the macroscopic scale. The body and charged beliefs behave like fermions. The deep consciousness has "helicity bias" and contains the lost spin to statistically balance all neutrinos in the universe. Since all matter contains or is linked to neutrinos, the deep consciousness is directly or indirectly connected to every particle in the universe. (8) All neutral quarks are neutrinos, and all charged quarks carry the charge in a lepton partner that accompanies them. Each free charged lepton has an un-charged free neutrino sidekick somewhere (e.g., electron and electron antineutrino or positron and neutrino). This neutrino "mapping" is a fundamental part (but probably not all) of the "Akashic Records" Cosmic Memory System. (9) The Vacuum State itself is the Ground State Cosmic Neutrino. (10) Through certain techniques such as meditation and dervish whirling humans can recover conscious access to deep consciousness and regain conscious contact with the Akashic "neutrino"

memory system and other features of deep consciousness that reflect primordial states of the Cosmos. This restores consciousness to its original balanced and unified gauge boson quality and is known as “enlightenment”.



[The above drawing is based on Eisberg and Resnick, **Quantum Physics of Atoms Molecules, Solids, Nuclei, and Particles,** Fig. 16-11, p. 567 and shows schematically the relation of the electron and neutrino to the Dirac “sea”. Below the Zero Point of Pure Awareness we have energy “holes”, and above the Zero Point we have energy “particles”. Imagine marbles on a Chinese checker board. The neutrino has no well-defined rest mass or charge and tends to smear across an energy spectrum. However, neutrino spin is reversed on either side of the Zero Point. The electron-positron pair has a minimum energy gap of 2 *Me c*^2.]





* The above sketch on the left shows a quark-oriented representation of beta decay of a neutron into a proton. A neutron has two down quarks and an up quark. A proton has two up quarks and a down quark. “Time” appears to flow from left to right. The sketch shows that neutron consists of a neutral up quark, a negative down quark, and a positive anti-down quark. The down

quark appears to decay into an up quark releasing an electron and an antineutrino. However, charge and energy type must be conserved, so the down quark seems to pass its charge to the electron, and the antineutrino passes its "antiness" and neutrality to the quark. But the up quark flips direction in time, and thus flips its "antiness". The up quark is a fat neutrino. What appears to be a down quark is really a neutral anti-up quark plus a negative electron and an antineutrino. The sketch on the right shows this. We can see the critical role of the antineutrino. Neutrinos and up quarks have no charge, so they more easily slip from particle to antiparticle. The anti neutrino gloms to the up quark turning it into an anti-up quark. The extra mass-energy that this provides is just enough to pull the electron from its proton ground state to its neutron ground state, which is "inside" the proton. Actually it is not quite enough and requires the close proximity of other protons to hold it in. The quark representation in a Dirac-type drawing looks more like the neutrino than the electron, but has a larger energy range. We can think of negative down quarks as fat antineutrinos with electrons closely buzzing them. Positive down quarks are fat neutrinos with positrons buzzing them. The charge of an ensemble is in the associated electron or positron, not the quark.

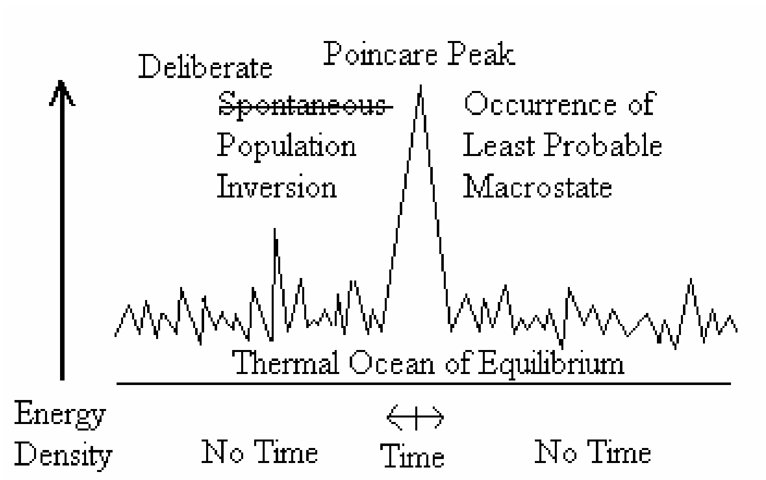
* **The OP model of charge is that it is a reflection of the photon circuit seeking its minimum quantum mechanical path – the path of least action.** Electrons in orbit around nuclei will fill the lower energy orbits first and then sequentially fill the more outward higher energy orbits. Each electron gets as close in as it can to the nearest antiparticle, given its kinetic motion and Pauli exclusion, so that its photon circuit always is as short as possible given these two major constraints. The antiparticle represents the "opposite" charge part of the circuit. This is the same as the way light in free space ends up going in a straight line. As Feynman shows in QED, all the other possibilities cancel out. Given the warped atomic spacetime of charged leptons, the winding photon path is the best "straight line" path. We call it "charge" because it behaves like a force pulling particles together or pushing them apart. Like charges repel because both circuits are flowing in the same direction so their paths conflict (like two garden hoses turned on and pushed head to head). They will drift away from each other and each will seek a path for circuit completion. For example, two hydrogen atoms will tend to bond lightly, each contributing its lone s-electron. The spherical orbit shell expands to a pill shape around the two protons and the two electrons tend to be on opposite sides of the shell with opposite spins. The protons complete the photon circuit flow from the electrons

and feed the photons back to the electrons as antiphotons, but the electrons can not get into the protons because their kinetic energy, Pauli exclusion, and Heisenberg uncertainty keeps them at ground state orbit on average.

* **Energy Conversion occurs when an Observer shifts his attention as he regards an oscillating system.** The energy of a system is fully dependent on observer viewpoint. Physics recognizes mechanical energy, electromagnetic energy, gravitational energy, and atomic energy. We can use a **spinning circle** to model the behavior of energy. The fact that the circle spins indicates a presence of energy. Only an observer can tell if it "really" is spinning or not and how it is spinning depending on how he views the circle. **Mechanical energy** is carried by the amplitude of an oscillation. In a circle this is the **radius**. It represents resistance because it keeps the circle from collapsing into the center under the influence of gravity. This gives the illusion of mass. **Electromagnetic energy** is carried by the **frequency** of the oscillation. This is the speed at which the circle rotates on its center point. **Gravitational energy** is carried by the singularity of the system. We call it the center of mass, and for a circle it is the **center** of the circle. Atomic energy ("strong" interaction) does not exist. The energy produced by nuclear power plants and bombs is due to electromagnetic radiation, weak interaction decays, and particle-antiparticle annihilations that release more electromagnetic radiation. But the so-called **weak interaction** is a fourth type of energy. In our circle model it is properly called the **phase interaction** and it does carry energy in the form of information. Phase requires an extra point outside the circle that serves as an observer viewpoint. From a properly chosen viewpoint an observer can see the whole circle as a phase wave. The "weak" interaction represents a phase shift in a system, and it is not necessarily "weak" at all, but can be very powerful. (For example, if you understand some of the ideas in this summary and on this website, they may have a powerful influence on your life.) Rotation of the circle makes no sense without an external observer viewpoint that can distinguish the phase of the rotation as it passes through time. Time is generated by the frequency of the spin and hence is closely related to the fundamental notion of energy. Without motion there is no time and no energy. Space is generated by the wavelength which is the interaction of the frequency and the amplitude. Gravity integrates the whole process around a central point. The phase is the interaction between the observer and the oscillating system. Nuclear decay is a phase shift. If we reverse the shift we get nuclear fusion. What physics thinks of as atomic energy is spacelike harmonic vibration. It is

a combination of the other forces. Heat is considered the lowest form of energy and consists of the kinetic motions of the components within a system. Heat as the random motion of particles is the conjugate of gravity. The phase wave is always oriented orthogonally to the matter wave. The tangent to the circle is always orthogonal to the radius. Transducers are substances that facilitate conversion from one energy type to another. If the observer moves away from the circle, the radius appears to shrink. If he moves far enough, the circle becomes indistinguishable from the center. Mass then disappears (approaches zero as a limit) and so do heat, resistance, and entropy. Why does the circle spin in the first place? This is the fundamental oscillation of the observer's consciousness. He starts it spinning. To get a feel for this, practice Sufi whirling and do the exercise of combining both halves of the spin, body and surroundings. Then you return to the condition of the gauge boson field.

Contemplate and Experiment with the Above Observer Viewpoints
(Each sideways V represents an observer viewpoint.)



* **Poincare Peaks: Observer Physics draws attention to Poincare Peaks. These are the unavoidable periodic recurrences of the least probable states of a system that were predicted by Henri Poincare.** If we assume that the energy in the universe is conserved and continues to change states at any given average rate you please, sooner or later every possible microstate will occur, including the most improbable microstates and macrostates. Physicists commonly object that the phase space for any fairly complex system of particles

(such as the air molecules in a room, not to speak of a whole universe) is so vast that its probability of producing such unlikely microstates places it way beyond the probable life of the universe. The problem with such arguments is that the physicist takes the observer viewpoint of a human localized on a planet with a very limited life span. If the observer shifts to a viewpoint that is outside of time, all possible states of the system coexist at once. The observer then simply decides which state he wishes to put attention on. Experiencing a Poincare Peak of any probability is then simply a matter of viewpoint choice on the part of the observer.

* **Removal of Entropy from a System: Cooling a system reduces its entropy. But the simplest way to remove entropy from a system is to simplify it. Unitizing removes all entropy from a system.** Unitizing can be achieved by a simple shift of Observer viewpoint. For example, imagine that you are really huge and the whole universe is a single little particle inside you that is about the size of a flea. This viewpoint effectively reverses the presumed expansion of the universe and removes all its entropy in one stroke. Of course, you may be too attached to some stuff you have going on to stay with such a viewpoint, but that is a different matter.

The Rules for Creating Universes

0. The Observer begins with a triplet of undefined primitives, one of which is himself. These will play in a universe of nothingness. In our universe we chose Time (Change), Length (Space), and Mass (Observer Resistance) as our primitives. Mathematically we express the emptiness as an endless string of 0's. The true nature of the Observer is pure light (or we can call it Pure Awareness) that has no Mass. From the viewpoint of Light-Awareness there also is no Time or Space or Mass.

1. The primitives will form invariant relationships of geometry in the Observer's Mind Space and invariant relationships of physical structure in the Observer's World Space. Both are fundamentally nothing. Once you have established your small set of fundamental physical invariants as relationships among the primitives, use factors from the constants of geometry to shift each physical constant to an exact power of 10 while maintaining the dimensional units of each physical constant unchanged. For example, in our universe we can transform the speed of light (3x10^8 m/s) into (10^8 m/s) if we multiply it by a factor made entirely of constants from geometry that equal

the pure number 1/3. An easy way is to divide the volume of a unit sphere by the area of a unit sphere times the spatial constant (*b*). For these calculations we use the radius as the unit for a sphere rather than the diameter. For example, the circumference of a unit circle is $2 \pi r$. We set $r = b$, the spatial constant of 1 meter, so our unit figures have specific sizes in physical space even though they still do not represent anything solid. They are still only abstract possibilities.

2. Identify all the fundamental physical constants that contain mass units and organize them into the various combinations such that all the units cancel out. Pay no attention to ratios and scales in this operation. This procedure generates a set of pure number ratios and scales expressed in terms of the physical constants. For example, in our universe we can divide Planck's Constant ($\hbar$) by the Electric Charge Constant (*e*) times (%) squared and get a dimensionless constant. The Magnetic Flux Quantum (Φ_o) divided by the spatial constants (%)^2 or (*b*)^2 would be another example.

3. Substitute the power-of-ten versions for each of the physical constants derived in step (1) into the combinations without mass that you derived in step (2). Thus each pure dimensionless number in step (2) becomes expressed in terms of powers of ten.

4. Total up the exponents of the powers of ten expressions and set the total equal to the factor [Pi times (%) squared divided by the area of a unit circle] taken to the power of your total: [π %^2 / *Ao*]^*n*, where [*Ao*] is a circular area with radius (*b*) and *n* is the exponential power that the total string of factors generates. (Just add up the exponents of all the factors in the string.)

This procedure gives you an equation for each possible combination of physical constants expressed totally in terms of the constants of geometry, that is, some power of the Scaling Factor expression [π %^2 / *Ao*] = 10. Since you already have a power-of-ten version for each physical constant, you can obviously write each combination as a power of ten. The Scaling Factor can match that at any power and it happens to be a constant in both geometry and physics and links between the Observer's Mind and his World.

Suppose you then want to manifest a proton to get your material universe started. It is frozen in the vacuum of nothingness (000000000000) as merely a possibility. The Scaling Factor expression can be set at any power and will insert a 1 somewhere into the field of 0's. Taking it to the 0^{th} power gives it the value of unity, so start there.

You can choose one of the power-of-ten formulas from step (4) that suits your needs. They all coexist as possibilities. Each is some string of factors that equals some power of the Scaling Factor. This means the ratio of the string of factors to the Scaling Factor at the chosen power is 1. This is your unity.

Then rearrange the factors of your chosen string, grouping them so that the constants that define a proton are put into one set of brackets. Then shift all the remaining factors over to the side of the equation where the Scaling Factor is and neaten them up a bit. For our example we find that a proton equals the permittivity constant times the Scaling Factor to the -18th power times the Scaling Operator cubed times the area of a unit sphere squared divided by the circumference of a unit circle times the volume of a unit sphere. Thus the mass of this particle (1.67x10^-27 kg) turns out to be the permittivity constant of a vacuum times a bunch of empty bubbles based on the constant of space (*b*) used as the unit radius of the bubbles. The Scaling Operator adjusts the scale. The permittivity allows a certain amount of mass per volume of space. The empty bubbles match the volume of space and adjust the ratio of the permittivity to the correct value for a proton, neutron, or hydrogen atom to appear. Like magic the particle leaps out of the vacuum of nothingness simply because we created the possibility of mass to exist in space. How much the mass turns out to be is determined by the way the bubbles can fit together with the permittivity and the other physical constants that can cooperate to form a mass. Thus only certain types of particles are allowed because the whole ensemble has to balance out to a Unity floating within Nothingness, a 1 floating somewhere in an ocean of 0's. This is the primitive relationship of point and space. The Observer chooses how to define his point within space.

1) *X*^0 = 00000000000000000001.00000000000000000000000000000. . . .

2) (0.000 000 000 000 000 001) (100 000 000 000 000 000.0) = *X*^0

3) (*e* π *Oo* %^-1) (*Ɛo*^-1 *As*^-3 *Ss*^2) (*c*^-1 *Ss*^-1 *b As*) (%^-2) = (π %^2 / *Ao*)^-18.
   (10^-18) (10^-8) (10^9) (10^-1) = (10^-18)

4) (π *b e* / *c*) (*Ɛo* ^-1) (%^-3 *As*^-2 *Oo Ss*) = (π %^2 / *Ao*)^-18

5) *Mp* = (*Ɛo*) (%^3 *As*^2 *Oo*^-1 *Ss*^-1) (π %^2 / *Ao*)^-18

6) 0.000 000 000 000 000 000 000 000 001 67 kg. (Proton Magically Appears)

In the above data (*Oo*) stands for the circumference of the unit circle, (*Ao*) is the area of the same circle, (*As*) is the area of a unit sphere, and (*Ss*) is the volume of the same sphere. These are the empty bubbles of space that we work with. We can create a proton or hydrogen atom or neutron, because the peculiar mass that it has (*Mp*), or slightly different variants covered by an adjusting Scale or other factor depending on conditions, is basically equal to the expression ($\pi\ b\ e\ /\ c$) and we find the required constants within the empty string of nothing. The cluster of relations we start with has NO mass. It is only a Singular Oneness in a field of 0's. This is the quantum foam boiling up into bubbles and giving forth real particles of matter! This procedure demonstrates how the vacuum state is a very organized and intelligent bunch of Nothing. What will be possible in your universe will depend on the relationships you define for your primitive Units. This is Observer Physics.

Nicholas Moller says of Nobel Laureate Irving Langmuir ("Irving Langmuir and Atomic Hydrogen", p. 3, full text of article at jlnlabs.imars.com/mahg/article/**langmuir**_nm.pdf):

"This principle of research he found extremely useful on many occasions. When it is suspected that some useful result is to be obtained by avoiding certain undesired factors, but it is found that these factors are very difficult to avoid, then it is a good idea to increase deliberately each one of these factors in turn so as to exaggerate their bad effects, and thus become so familiar with them that one can determine whether it is really worth while avoiding them. For example, if you have in lamps a vacuum as good as you know you can produce, but suspect that the lamps would be better if you had a vacuum, say, 100 times as good it may be the best policy, instead of attempting to devise methods of improving this vacuum, to spoil the vacuum deliberately in known ways, and you may then find that no improvement in vacuum is needed or just how much better the vacuum needs to be."