

Article

## Physics & Cosmic Order III: Introducing System 3

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### ABSTRACT

System 3 has two sets of three centers, one set being unique and universal, the other set being particular and manifold. Each set has two orientations making a total of four terms. They interact in pairs, alternating between a quantum frame and a space frame in the synchronous projection of phenomenal experience frame by frame, as in a cosmic movie. In the alternate quantum frame atoms transform into timeless and formless bundles of photon energy equivalents that are universally integrated into an orthogonal energy field that is called the Void. Linear time derives from the synchronous recurrence of space frames in which particulate sets delineate three dimensional atoms. Light originating from within atoms defines space with respect to each atom, linking up all atoms within each space frame to provide the integrated fabric of space-time. Space and time are quantized accordingly. The quark-like universal set tunnels counterclockwise through the particular set. This gives rise to charge between centers 2 (electron) and 3 (proton), whereas clockwise tunneling corresponds to a degenerate involutory variant and antimatter. A regenerative variant accounts for the neutron, being stable only in connection with the expressive variant that delineates the photon, electron and proton. The neutrino is a particle remnant of a photon associated with decay processes. A new quantum relativity emerges naturally with profound implications in many areas.

**Key Words:** Cosmic Order, physics, System 3, Void, cosmic movie, atomic structure, light.

### System 3 Generated by Two Sets of Three Centers:

System 3 is generated by two *sets* of three independent yet mutually related active interfaces or centers.<sup>1</sup> The nature of the three active interfaces is identified by a universal hierarchy that specifies their step-like progression from a universal center or inside to a universal periphery or outside.

There are only four possible ways that three centers can relate to one another with respect to a universal inside and outside consistent with Systems 1 and 2. The Systems coexist and are not derived one from another in a temporal sequence. Each of the four ways will be called a term, so that we may designate terms 1, 2, 3 and 4. They are illustrated in the passive perspective in Figure III-1. They are shown in the active perspective in Figures III-2, III-3, III-4 and III-5.

The four terms are required to mutually interact in a pattern that elaborates on Systems 1 and 2. The terms thus derive from two interdependent sets of centers. One set is unique and universal.

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E-mail: [bob@cosmic-mindreach.com](mailto:bob@cosmic-mindreach.com) Note: The articles presented in this Focus Issue are based on my book "SCIENCE AND COSMIC ORDER: A New Prospectus (Book I: Physics)" self-published in 1997 and updated in 2012. More information is available at my website .

<sup>1</sup> Campbell R. System 3. <http://www.cosmic-mindreach.com/System3.html>, 2005.

The other set is manifold and particular. Each set has two alternate orientations, one objective and one subjective, consistent with System 2. Terms 1 and 2 are alternating objective and subjective orientations of the universal set. Terms 3 and 4 are alternating objective and subjective orientations of the particular set. The two sets work together in pairs.

Since terms 2 and 4 are subjectively oriented they always occur together in alternation with the objectively oriented terms 1 and 3. It will be said that the universal and particular terms *cohere* together in each orientation. They interact as one. The alternate orientations of the mutually coherent two sets delineate what will be called the *primary activity* accordingly.

### **The Primary Projection of Space and Time:**

System 3 specifies the structural dynamics of the atom. The three active interfaces or centers C1, C2, and C3 correspond respectively to photon, electron and proton in a primary hydrogen atom.

The particular and universal sets cohere together to define a three dimensional space-frame to each primary hydrogen atom, alternating with a formless and timeless quantum frame. This prescribes a succession of atomic space-frames in which electromagnetic radiation is the only activity. Light links up separate atoms to integrate the fabric of space in each space frame. The timeless quantum frames collectively constitute the conjugate formless Void. Each synchronous recurrence of a space frame defines a primary interval of time in the linear succession of still space-frames, similar to David Bohm's cosmic holographic movie.<sup>2</sup>

### **Deciphering Meanings of Terms in Alternating Orientations:**

The alternating orientation of the universal set regulates the synchronous recall of the quantum energy equivalents of all atoms in the universe from the Void into particulate form, everywhere at once. This results in a very rapid series of synchronous frames that provide the integrated fabric of space- time in the holographic comic movie.

It will be said that the objective orientation of the universal set, term 1, has discretionary characteristics, since it integrates the quantum energies of the particular sets in the Void for coherent recall into another integrated space frame in the projection of the cosmic movie. This will be explained more later.

The subjective orientation of the universal set, term 2, acts as a *means* of linking up the three particular centers (photon, electron and proton) of each set into whole atoms everywhere at once. This will become apparent in the active perspectives where it can be seen how the two sets of terms cohere together.

The objective orientation of each particular set may be seen as a *goal*, since the universal inside and outside of each atom are coalesced together in a timeless energy bundle. The active representation shows how the internal and external aspects of each atom find eternal reconciliation, which is nevertheless subject to recall by the universal set.

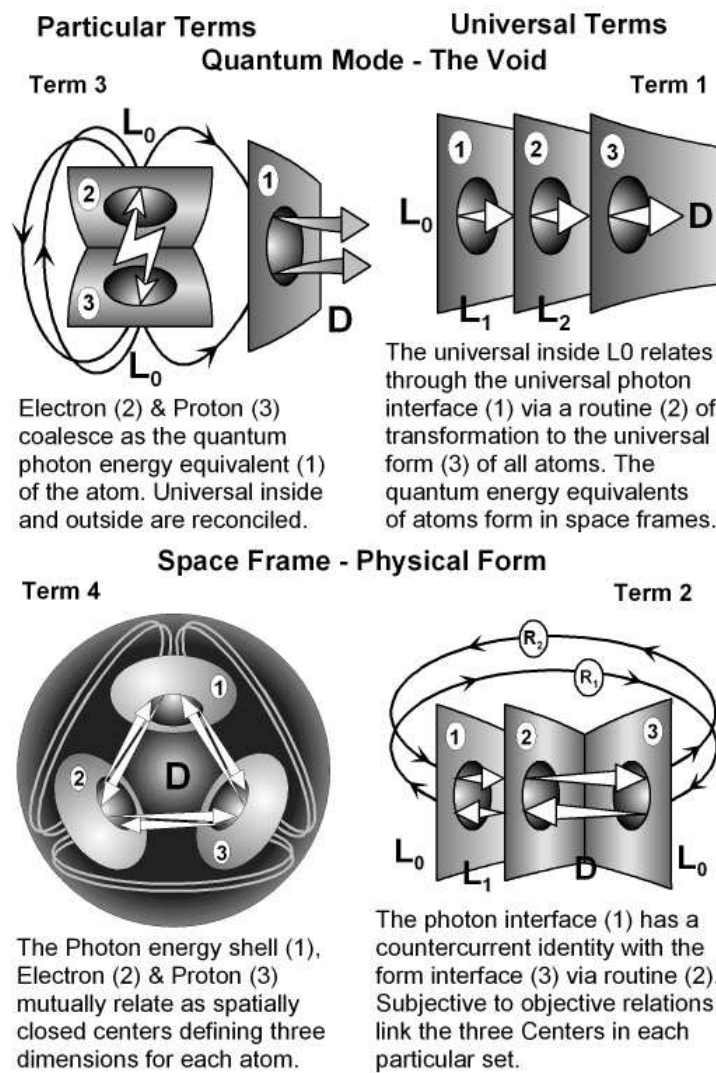
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<sup>2</sup> Bohm D. Wholeness and the Implicate Order, Routledge and Kegan Paul Ltd., London, 1980.

The integrated *Void* of quantum energies is a boundless field with characteristics of *universal wholeness*. This may be seen as a *goal*, since the creative process must mend the *rift in universal wholeness*.

In the subjective orientation of each particular set, term 4, the three centers form closed surfaces with respect to one another. This identifies them in three dimensions as photon, electron and proton respectively in the manner that they cohere together with the subjective orientation of the universal set. This will be called a *consequence of the primary activity*.

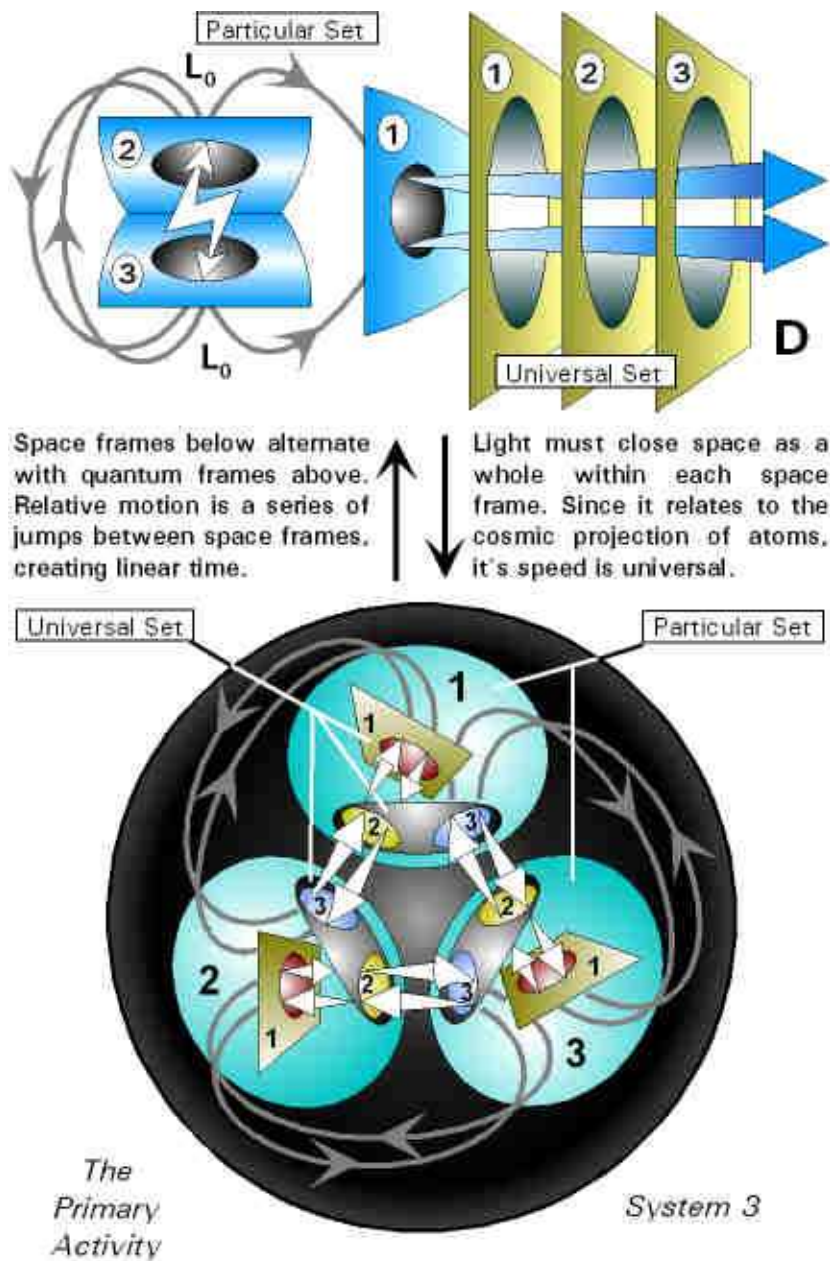
The primary activity thus defines space and time with respect to each primary hydrogen atom. This general picture will be clarified when we examine the active perspectives of each term and how they cohere and interact together. See Figure III-2 below:



**SYSTEM 3 TERMS - ACTIVE PERSPECTIVE**

Figure III-2

The four Terms cohere together in pairs as shown in Figure III-3. The objective timeless quantum frame above alternates with the subjective space frame for each atom below.



**Figure III-3**

It should be noted here that subjective and objective orientations begin to compound within themselves. This is consistent with the way the System elaborates in discrete stages within itself. The complex compounding of subjective and objective orientations, one within the other, proliferates in all the higher Systems. For example Rover is a dog that is objectively separate from Lassie but they are both subjectively dogs that are objectively separate from humans even

though dogs and humans both share subjective characteristics as vertebrate animals, and so on. Universals and particulars interact in cycles within hierarchical cycles.

This is why language is such a hopelessly simplistic tool to express the cosmic order. Linear logic can not untie the knots within knots that become ever more complex in the cycles within cycles of the higher Systems. Only the graphical representations of hierarchical relationships between the universal inside and universal outside can facilitate direct intuitive insight into the structural dynamics of the cosmic order. The meaning in language derives from the way the cosmic order works.

### **Three Dimensions to Space in the Subjective Orientation:**

The three particular centers of the subjective orientation in term 4 are mutually separate and face one another. In order for them to be mutually separate they must be mutually *closed*. In other words they must exhibit mutually *closed surfaces* that define three dimensions or they could not be mutually separate. This requires that each of the three centers must exhibit closed spherical characteristics. They are represented by elliptical surfaces in the active diagram of term 4, and in the bottom half of Figure III-3. The photon interface exhibits a closed spherical energy shell. The electron and proton interfaces exhibit themselves as hard physical particles of matter with mass.

It can be noted here that the structural requirement for mutual closure is always implicit in three active interfaces that are mutually separate and face one another. Each must be spatially closed with respect to the other two. Yet they must remain intimately related as a particulate triad of centers that define one whole. This works in a variety of ways in the higher systems which become much more complex. Only triadic relationships of this general kind are mutually closed.

Conversely, the universal set of three centers cannot exist as separate centers with three dimensional characteristics or they could not be universal. They can not define a three dimensional limit to the universe without contradicting requirements implicit in System 1. A limit to space and time invites the question what is beyond that. It does not make sense.

The three universal centers are thus *open* as opposed to *closed*. Open centers are represented by two dimensional surfaces in the diagrams. They can not independently exist as separate things in space and time even though they are real centers associated with physical things. They transcend the limitations of space and time. In term 2 they universally define a subjective to objective relationship. This requires that they must be confined within particular centers.

In the atomic space-frame, term 4, the open universal centers of term 2 are confined within each closed particulate set of three centers in term 4, like quarks, as shown in the space frame side of Figure III-3.<sup>3</sup> They define the *subjective to objective relationship* between each of the three

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<sup>3</sup> This also means that the three centers of a particular atom remain linked even if they become separated far beyond the spatial limits of the atom. This accounts for the paradox of Einstein, Podolsky and Rosen and the experimental failure of Bell's inequalities to rule out action-at-a-distance. This does not mean that action can be transmitted through the integrated fabric of space-time faster than light. It means that the universal synchronous projection of the universe inherently links the particles intimately together, frame by frame. This is consistent with Bohm's universal quantum potential. Bohm D, Peat FD. *Science, Order, & Creativity*. NY: Bantam, 1987.

closed particular centers of term 4, namely photon, electron and proton. They tunnel through the particular centers to intimately link up the three particular centers *in pairs* to form each whole atom. They do it for all atoms in the universe everywhere at once. Note that it is essential for the universal linking up between particular pairs of centers to proceed in the same countercurrent direction. No closed particular interface can have two universal centers.

This structure explains *why* primary hydrogen atoms universally consist of closed photon energy shells, particulate electrons and particulate protons that are universally identical. The photon energy shell provides a closed spherical boundary for each atom. It defines the inner space of the atom, distinct from external space. It defines the *Idea* of a whole atom. The electron provides a *Routine* of activity that relates the photon energy shell to the proton. The mass of the physical atom is concentrated in the central *Form* of the proton. The universal set defines the universal hierarchy: *Idea* → *Routine* → *Form*<sup>4</sup> in this way. The photon, electron and proton are everywhere intimately linked by one unique universal set as whole separate atoms. Each physical atom is a distinct subjective orientation of how a particular and universal set *intimately cohere* together. This subjectively defines all atoms that objectively exist as separate physical things in external space as illustrated on the space frame side in the bottom half of Figure III-3.

The universal linking up of photon, electron, and proton in a neutral atom defines the inner space of the atom, distinct from the outer space between separate atoms. The inner space is spherical and thus orthogonal to linear external space. The photon energy shell defines the ionization limit of the atom. Light originates from within atoms and thus defines external linear space with respect to the inner spherical space of each atom in each space frame. The cosmic projection of independent atoms constitutes the universal measuring rod of space and time relative to light. Both space and time are quantized accordingly relative to each atom. That is *why* the speed of light is universal. There is otherwise no explanation.

The *universal means* to activity entails a balance between countercurrent identities **R<sub>1</sub>** and **R<sub>2</sub>** in term 2 as illustrated in Figure III-2. They relate a subjective to an objective aspect. A thing's identity is known through a common sense belief that everything has both an inside and an outside. The subjective Idea C1 relates to objective Form C3 via the Routine C2. The active routine is the axis between inside and outside.

In one sense we are indebted to the Aristotelian side of our heritage and Aristotle's insistence that the essence of a thing is within the thing itself. But we see also, in how the terms interact, that everything is a member of a universal class or archetypal energy pattern, sharing characteristics with all things of its kind, just as Plato maintained in his Theory of Forms.<sup>5</sup> As an elaboration of System 2, the universal characteristics of System 3 transcend and subsume the

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<sup>4</sup> Hierarchies are an implicit characteristic of phenomenal experience. Logical paradoxes arise by not taking universal hierarchies into account. In Russell's well known paradox *The Contradiction* arises when classes are treated as being on a par with their members. Russell, Bertrand, *The Principles of Mathematics*, 2nd ed., London: George Allen & Unwin, 1937.

<sup>5</sup> Aristotle interpreted Platonic forms as universals, rejecting the implication of transcendence. He made a distinction between primary and secondary substance (in the *Categories*) in which species and genera, for example, assume a secondary status. Owens J. *The Doctrine of Being in the Aristotelian Metaphysics* 2nd ed. Toronto: Pontifical Institute of Mediaeval Studies, 1963.

particular characteristics, as evidenced in each atom. This works in more complex ways in System 4 and the higher Systems that introduce degrees of universality.

### **The Quantum Frame as the Void:**

The subjective particulate orientation has physical *form* as three dimensional surfaces. It is called a *space-frame* as illustrated in the bottom half of Figure III-3. The alternate *quantum frame* in the top half of Figure III-3 has no physical form. It is a balanced *quantum of photon energy*. It is an energy package that timelessly reconciles inside and outside as it relates to each particular atom represented also by term 3 in Figure III-2. The photon, electron and proton centers that constitute each quantum equivalent of each atom are coalesced together as *one open photon interface*. All such open interfaces are energy equivalents of individual atoms. They are universally integrated as *One* by the universal term 1 illustrated separately in Figure III-2. They are *One* with the universal photon interface (center 1 in term 1) that integrates the formless energies of atoms as a boundless energy field that is called *the Void*. The universal set in the top half of Figure III-3 thus integrates the quantum energies of all the atoms of the universe at once.

Biological evolution takes place within the context of the physical creation in accord with Systems 4 and higher, all of which have formless terms that reconcile the universal inside and outside as coalesced quantum energy packets. These formless and timeless elements of technique coalesced within open energy interfaces are subject to recall.

The Void embraces the whole of historical memory, in the broadest sense, while also placing certain constraints on the future because of the nature of the past and the structural requirements of recall back to the world of physical form. The Void *historically integrates* phenomenal experience. Historic integration spans and integrates events as we perceive them in space and time.

Atoms jump back and forth synchronously between the particulate space frames and quantum frames. Since the quantum frames are formless and timeless the particulate space frames close ranks to provide the illusion of continuous space. On the space-frame side this is called *the integrated fabric of space-time*. The timeless Void is orthogonal to the integrated fabric of space-time. There is an irrational boundless seam associated with the rift in universal wholeness between the synchronous projection of each integrated space-frame.<sup>6</sup> (*Space-time* is hyphenated to distinguish it from the *spacetime continuum* of general relativity.) In this way these two alternating modes define events in the discontinuous projection of space and time.<sup>7</sup>

The jumps back and forth define the wave-particle character of matter. Atoms are waves and particles *at the same time*, since each successive space-frame recalled from a timeless quantum

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<sup>6</sup> Irrational numbers display a lack of continuity. Richard Dedekind recognized that space is both continuous and everywhere discontinuous. Dedekind R. *Essays on the Theory of Numbers*, [1858]. NY: Dover, 1963.

<sup>7</sup> The idea of space-time continuity has been questioned for 2500 years, when Zeno of Elea formulated his famous paradoxes to illustrate the absurdity of logic based on the assumption of a continuum which allows of infinitesimals. Raven, J.E. *Pythagoras and the Eleatics*, Cambridge, 1948. The point is that Zeno's arrow must reach the target on time because it travels a discrete distance in each primary interval of time. There is no paradox in a discontinuous universe because space and time are not infinitely divisible.

frame defines a *primary interval of time*.<sup>8</sup> The wave character of matter only becomes apparent with relative motions. Exact relative position is defined in a single space frame while momentum requires a succession of relative quantum jumps in position between space frames. The more one is known the less the other can be known precisely, consistent with the uncertainty principle.

### System 3 and Electronic Charge:

The bottom half of the System 3 diagram in Figure III-3 shows the universal set linking up the three centers of the particular set in pairs. This happens in a counterclockwise direction such that the universal (U) and particular (P) Centers UC2, PC2 and UC3, PC3 correspond across the interval between the particular centers 2 and 3. They are mutually aligned active interfaces. There is a universal subjective to objective distinction between particular electrons (PC2) and protons (PC3) that is associated with electronic charge. The particulate electron interface (PC2) has the universal photon *Idea* interface (UC1) inside it as it relates to the particulate proton (PC3). This means that there is a subjective to objective energy difference in the relationship of the electron (PC2) to the proton (PC3). Nevertheless the countercurrent identities  $R_1$  and  $R_2$  of the universal set that *tunnels* through and links electron and proton, require that the charge difference must be equal and opposite.

This energy difference that accounts for charge between electron and proton is reinforced by the inverse relationship of electron (PC2) and proton (PC3) in the way that they are independently linked to the photon (PC1) by the tunneling of the universal set.

If an atom receives sufficient photon energy to eject the electron beyond the ionization limit that defines the inner space of the atom prescribed by the photon energy shell, it still remains linked to its proton partner by countercurrent identities  $R_1$  and  $R_2$ <sup>9</sup> (in term 2 of Figure III-2) of the universal set. This must be so since they remain linked as a quantum of photon energy in the timeless quantum mode, called the Void that spans and integrates events in space and time. This requires that the universal photon energy implicit in the countercurrent identities must span a succession of space frames to link electron and proton in the integrated fabric of space-time. The universal set will reach to the ends of space and time to do this.<sup>10</sup> This drawn out spanning across space frames accounts for electromagnetic fields consistent with Maxwell's equations.

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<sup>8</sup> Quantum theory emerged out of a heated debate between Heisenberg's discrete atomic states of matrix theory and Schrödinger's wave transitions from one harmonic mode to another. While Schrödinger's waves salvage a perceptual model of the atom, the wave function is deemed to suddenly and discontinuously collapse when making quantum mechanical measurements. These two views are mathematically equivalent and both are essential to the theory. In the context of System 3, their general equivalence is apparent if the wave motion is seen to result from a series of discrete quantum jumps in position from space frame to space frame. However Heisenberg went further, claiming his uncertainty relations to be true and unalterable, mounting a challenge to causality while arguing that statistical uncertainty enters because of the physicist's attempt to observe nature. Cassidy, D.C., *Uncertainty: The Life and Science of Werner Heisenberg*, NY: WH Freeman, 1991; Cassidy DC. Heisenberg, *Uncertainty and the Quantum Revolution*. Scientific American, Vol. 266 No. 5, May 1992. In the view offered here, it can be seen that position and momentum cannot be known simultaneously simply because relative position is defined within a single space frame, while relative motion is defined over a succession of frames.

<sup>9</sup> The Relational Wholes  $R_1$  and  $R_2$  designate energy efflux from  $L_0$  from within one center completing a circuit back to  $L_0$  within another center since all active interfaces share a universal inside, as prescribed by System 1.

<sup>10</sup> Quantum correlation stems from the synchronous projection of all atoms.



Note in the space frame side of Figure III-3 that if the tunneling of the universal set that links PC1, PC2, and PC3 is reversed to a clockwise direction with respect to the particular set then universal and particular centers do not correspond across the interval between PC2 and PC3. Their alignment is mutually reversed thus reversing charge, resulting in antimatter. This is a degenerate variant of System 3 that is normally very short lived. It is called the *involutionary variant* as opposed to the *evolutionary variant* of a normal atom. There is also a *regenerative mode* of System 3 that defines a neutron that will be discussed later. The neutrino qualifies as a photon remnant of decay processes.

### **Conjugate Identities and the Void:**

The quantum frame is the conjugate *inverse* of the particulate space-frame as illustrated in Figure III-3. In the space frame the universal set is confined inside the closed centers of the particular set linking them up. In the quantum frame all particular sets constitute the universal center 1. Each particular atom is quantized as a particular photonic energy bundle, center 1. Collectively all such quantized photonic energy bundles constitute the universal photonic center 1 in the universal set.

In the space frame the photon energy shell PC1, the electron PC2, and the proton PC3<sup>11</sup> are mutually closed separate surfaces. In the quantum frame the electron and proton are coalesced as one with the open photon interface PC1.

In summary there is a mass-energy equivalence between the mass of the particle space-frame and the energy of the corresponding quantum frame that manifests in each succeeding space-frame. There is no particulate motion within each atomic space-frame that collectively constitute the integrated fabric of space that defines a synchronous still projection of the whole physical universe regardless of its extent.

All relative motion occurs as relative quantum jumps in position between space-frames. The only activity within each space frame is electromagnetic in nature. The integrated fabric of space-time is a linear series of still frames. The universe is very rapidly disappearing and recurring with and before our eyes.

Light is in active reflux through the physical form of the cosmic movie. Light links up all atoms to define external linear space relative to the inner spherical space of each atom. There is an inverse relationship here also since linear external space is orthogonal to the inner spherical space of each atom. In the quantum frame the internal and external aspects of each atom are coalesced in an eternal relationship that is integrated in the Void and the Void is orthogonal to the integrated fabric of space-time.

Later it will be shown that relative motion introduces relative space-frame skipping which accounts for relativistic effects. Because there is equivalence between the quantum energy equivalents in the Void and the immediately following projection of an integrated space frame,

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<sup>11</sup> C1, C2, C3 are used to designate the relevant centers. PC designates particular centers. UC designates universal centers.

the relative skipping of space-frame sequences introduces a corresponding increase in timeless quantum energy associated with a moving particle that manifests as increased relativistic mass.

This is why the famous equation  $E=mc^2$  defines relationships between a rapidly moving inertial frames of reference with respect to stationary reference frame.

It will be said that there is a *conjugate identity* between each particulate atom in a space frame and its formless energy equivalent in the preceding quantum frame, consistent with the Schrödinger wave equation.<sup>12</sup> When we are considering a particle moving with respect to a fixed apparatus there is a relative skipping of apparatus space frames with respect to the particle so the particle assumes relativistic distortions consistent with the Lorentz Transformations. This will be revisited in a later part.

Because all of the quantum energy equivalents of each and every atom in the universe are integrated into a unified quantum field by the single universal set the boundless energy field called the *Void* has meaning distinct from the so-called *vacuum* of traditional physics.

Conjugate identities between space and quantum frames are clearly distinct from how we normally interpret the physical equality between physically separate things such as two identical atoms in the integrated fabric of space-time. The mathematical equals sign generally relates to the latter kind of identity where we may say the mass of one atom equals that of another. We shall call this Aristotelian identity to distinguish it from conjugate identity. There are also triadic identities associated with how the universal set tunnels through to intimately link the three particular centers of the atom in each space frame. These are associated with quark theory.

### **The Integrating Power of the Universal Set and the Void:**

The universal photonic interface UC1 is the most central one in the universal set (term 1) of the quantum frame that integrates the energies of the Void. It contains the universal inside  $L_0$  and relates out through the electronic interface UC2 which in turn relates out through the universal protonic interface UC3 to the universal outside D. (See the Figures III-2 and III-3.) This defines a step-like progression from light energy inside to darkness outside.

However the Void is a formless and timeless energy field without specific boundaries or spatially explicit phenomena of any kind. It has timeless characteristics as a holistic energy field and yet it is totally Void of explicit phenomena.<sup>13</sup> The universal *Idea* of wholeness UC1 is spatially

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<sup>12</sup> The quantum energy equivalent of a moving particle is represented by the complex conjugate of the wave function in the Schrödinger wave equation.

<sup>13</sup> The Void it is a highly structured energy field, as will become more apparent in higher systems. It goes far beyond the accepted attributes of the vacuum in physics parlance. The latter is vaguely seen as a kind of infinite well of virtual particles accessible only within the constraints of the uncertainty principle. On the other hand it is a remarkable thing that the world's religious traditions have been making references to the Void and to an identity between form and emptiness for millennia, particularly in the East. Taoist poems are especially full of this kind of imagery and it is a theme in the Hindu and Buddhist traditions also. As the poet Wang Ching-yang expressed it long ago, "It's a vast and undivided expanse of shining mist." Blofeld J. *Taoism: The Road to Immortality*, Shambhala, Boston, 1985.

indeterminate or boundless. So the step-like or time-like progression can only be realized by a *Routine* UC2 synchronous transformation back to the particulate mode where all atoms in the universe are recalled as separate three dimensional *Forms* UC3. This defines a *primary interval of time*. The Void is thus a *master sensorium*. It is a master *memory bank* from which the universe of *forms* is recalled.

All physical atoms in the universe are thus synchronously recalled and projected from the Void as a discrete succession of independent space frames linked up by light. The electromagnetic spectrum is sliced across its entire breadth by the synchronous projection of each successive space frame. This accounts for Plank's constant and the quantization of light energy. Light is emitted from atomic processes and transmits as a series of discrete pulses consistent with each space-frame.

The particular quantum energy equivalents of each atom can not be specifically identified. in the quantum mode since they are open centers. They are universally integrated as the one Void. The particular electron interface PC2 and proton PC3 interfaces relate inside one another and thence outside through the open photon interface PC1, as illustrated in the top half of Figure III-3. This coalescence is illustrated by the Z shaped arrow in Figures III-2 and III-3. In this way they reconcile the universal inside with the universal outside. The internal and external aspects of each particular set are eternally balanced.

While the quantum energies of the Void are eternal, they are also subject to recall by the universal set. As constituents of heavenly bodies such as suns, planets, moons, comets and so on, atoms are perpetually in a state of complex relative motions from space-frame to space-frame. Constant inertial velocity does not involve any energy change between space frames but it does involve a constant process of relative space-frame skipping. Acceleration on the other hand involves energy changes from space-frame to space-frame that are associated with an increase or decrease in relative space-frame skipping.

These relative changes from space-frame to space-frame are effected through the Void by the universal set as it transforms from the objective orientation, term 1, back to the subjective orientation, term 2, in each succeeding space-frame. The universal set spontaneously integrates the universe of change frame by frame in the synchronous projection of the cosmic movie. It can be said to have discretionary characteristics that derive from the need for the physical universe to have a preponderant degree of *coherence* with itself. It is this universal property of coherence with all particular sets at once that preserves a preponderance of synchronicity in the universe as a whole. Electromagnetic fields that span and integrate a succession of space-frames to the very ends of space and time derive from these characteristics of the universal set.

### **Another Look at the Particular Transformations:**

The universal hierarchy of System 3 has been identified with the expression *Idea*→*Routine*→*Form*. In any human activity we give *Form* to *Idea* through a *Routine* of activity. We give form to an *Idea* in a painting by the *Routine* of making repeated brush strokes until the *Form* of the picture matches the idea we had in mind. The primary activity relates to all activity in a self-similar manner.

In the particular *goal* term shown as term 3 in Figure III-2, centers 2 and 3 of each particular set are coalesced as *one* within center 1. The universal *goal* of activity is the realization of unity. The *idea* of *universal wholeness* is achieved through the reconciliation of the subjective and objective aspects of experience as a creative enterprise.

Creation mends the *Rift in Wholeness*. In this term 3 we find that the particular *routine*, PC2, is coalesced with the particular *form*, PC3, within the *idea*, PC1. In human activity the coalescence of PC2 and PC3 represents an element of technique by which a specific *routine* results in a specific *form* consistent with the *idea*. In other words the particular idea implicitly contains a quantization of technique and yet the centers are open and unbounded, taking no specific identity as a physical form. The *routine* of pottery making coalesced with a *form* is nevertheless implicit in the *idea* of a vase. When we see the vase, any pottery vase, we appreciate the technique of its manufacture.

There is another way to visualize this. In term 3, PC2 and PC3 objectively relate directly to one another, but not directly to center PC1. They are inside center 1, being subjective to it. Centers 2 and 3 each contain the primary level of active intensity designated  $L_0$ , so that they form a mutually coalesced identity illustrated by the countercurrent flow within  $L_0$ . But since they are mutually *coalesced* as one, they also relate inside one another, and simultaneously outside through their common periphery, center 1. If there was no coalescence, there would be an intermediate graduation of active intensity,  $L_1$ , that would relate out through center 1 to darkness. But this is superseded by  $L_0$  in the coalescence. Centers 2 and 3 thus relate both inside and outside *at the same time*, reconciling the subjective and objective aspects of experience as a quantization of *routine* with *form*. This is an element of technique that makes the idea a reality, but not as a physical entity within this objective term. It takes careful reflection to see this.

### Particular Transformation

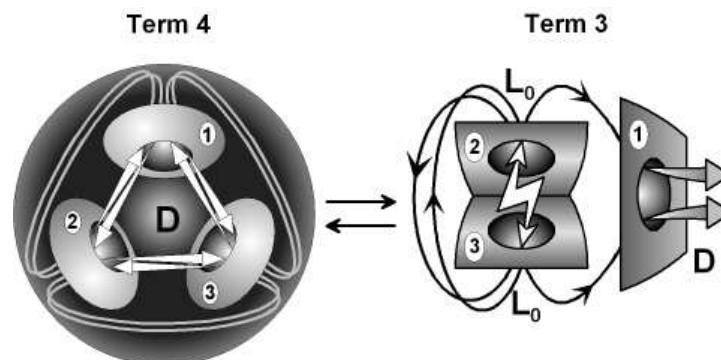


Figure III-4

The particular term 3 has no time-like characteristics as in the successive steps from a common inside to a common outside indicated in the universal term 1. On the contrary the term reconciles the internal and external aspects of experience through their *simultaneous* realization. Since the centers relate neither internally nor externally to the exclusion of the other, but rather both at once, it is an *eternal* relationship. The term thus represents a timeless element of cosmic memory in which energies are balanced in the realization of unity.

The cosmic memory is a *master sensorium* of quantized experience that is non-specific. It cannot be identified in space, or located in time. It is a mirror reflection of the whole of space and time as an indeterminate field of ordered energy from which quantized elements are assimilated by the universal set in the projection of the cosmic movie. Before pursuing this more it will be helpful to first take a look at Term 4.

Note that the transformations back and forth between terms 3 and 4 occur with the perceptual transposition of PC1 with respect to centers PC2 and PC3. It is the photon interface that turns around to face the electron and proton in the transformation to term 4, or alternately to contain them within itself in the transformation back to term 3. This is the inverse of the universal set where it is the UC3 form center that perceptually transposes.

The particulate world of our normal sensory experience, in which we see everything as separate physical things, is a *consequence* of the *primary activity* as delineated by System 3, and as further elaborated upon by the nested higher Systems. The three centers of term 4 are mutually balanced in an objective relationship, within the subjective context of the term. The term is a *consequence* of the objective balance achieved in the goal, term 3.

The three particular centers are spatially closed in term 4, lending atoms and molecules spatially identifiable surfaces. We humans, being clothed in molecules shared with universe, also have a transcending open archetypal interface consistent with System 2. In subsumed self-similar homologues of System 3 we thus also have a capacity to entertain creative *ideas* extended in space and time together with *routines* to give explicit *form* to thought and behavior. This self-similar manner by which the System elaborates within itself defines how the primary activity is a universal pattern to all activity.

The centers in each set are intimately related, unlike grains of sand on a beach, or molecules in the air, which consist of molecular collections of separate particular sets. We are talking about the kind of intimate relationship that exists between the nucleus, the cytoplasm and the membranes of a cell, or between the photon, electron and proton in an atom of elemental hydrogen.<sup>14</sup>

To say it another way each of the three centers perceives two others as separate and distinct, yet mutually essential to their mutual being. Each particulate center is linked to the two others by the countercurrent identities  $\mathbf{R}_1$  and  $\mathbf{R}_2$  of the universal term 2 that tunnels through the particular centers in pairs to intimately link them up. No set of relational wholes can form countercurrent identities between any two of the centers to the exclusion of the third. Each center must admit of a double identity that finds confirmation in the double identity of each of the other two centers. The resulting countercurrent identities require that there must be closed surfaces or boundaries that are spatially specific because of their dual nature. They cannot relate one on one, but must relate one on two, since all three are united as one. There are many subtle aspects to how the System works.

In primary hydrogen the dual identity between photons, electrons and protons lends them physical surfaces, distinct from the open unbounded interfaces of the universal set. Atoms assume physical

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<sup>14</sup> Hydrogen is primary in the projection of the physical universe. Biological creatures nevertheless exhibit self-similar homologues of System 3. For instance cells, organs, and host of complex plants and animals, are intimately related. They are mutually interdependent in how they work together as one.

forms in the tight succession of fleeting increments of time. They exist between transformations back into the orthogonal quantized elements of the timeless Void that span space and time.

Humans dressed up in atoms and molecules that constitute a physical body and can entertain *Ideas* translated into *Forms* by specific *Routines* that are not themselves physical things. A pair of shoes is a human *Idea*. We employ *Routines* of activity to shape molecules of leather into *Forms* consistent with the *Idea*. Human creations are distinct from atoms and molecules as things in themselves. Nevertheless all physical human activity works with physical matter. That does not mean that all human activity is causally driven by physical matter. We have evolved up through the species, climbing the ladder of sentient awareness from plants to invertebrates to vertebrates to human. In the process we have learned how to manage the physical environment by our creative capacity to employ the self-similar application of the System.<sup>15</sup>

In summary human beings are archetypes of System 2 clothed in the three dimension molecular forms of System 3. The archetypes of System 2 are highly organized active interfaces that transcend and subsume System 3 and with it events in space and time. The archetypes that transcend space and time give meaning to physical phenomena not the other way around.<sup>16</sup>

### Another Look at the Universal Transformations:

In term 1, the centers are nested one within the other, such that energy transformations successively traverse centers 1, 2 and 3 from a universal inside to a universal outside in darkness. There is nothing mysterious about this. Everyone knows that an *Idea* gives direction to *Routines* of activity that give direction to *Form*. This universal hierarchy is represented as *Idea*→*Routine*→*Form*. See Figure III-5.

### Universal Transformation

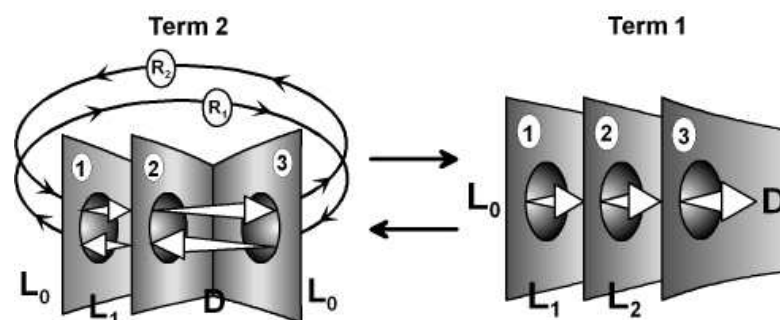


Figure III-5

<sup>15</sup> Two biological theories, both claiming consistency with Aristotle, contend that the form of the whole organism is a teleological factor in the development of its parts, its behavior, and its physiology. The vitalism theory differs from the organismic theory in maintaining that there is a non-physical entity associated with the organism. Woodger JH. *Biological Principles*, London, 1948. While both theories lack the ability to illustrate the precise relationship of parts to the whole, so do purely mechanistic chemical approaches to biology.

<sup>16</sup> Schubert-Soldern R. *Mechanism and Vitalism: Philosophical Aspects of Biology*, trans. Robin CE. Notre Dame U Press, 1962. Vitalism has limitations too. Since the System is intimately concerned with the dynamic interdependence of the universal and particular aspects of experience, it offers a new approach to understanding the integrated structure and function of living organisms. This becomes explicit with the elaboration of System 4.

Term 1 is an objective orientation since all three centers relate from a common inside to a common outside in darkness. Two intermediate graduations of active patterned energy are designated  $L_1$  and  $L_2$ . They represent the *Idea activity* that is subjective to *Routine* and the *Routine activity* that is subjective to the *Form* as it takes shape. In System 3, each of the universal centers is *open* and *unbounded*. This means that they relate universally to the whole of phenomenal experience. In a primary hydrogen atom this means that they relate to all the atoms in the universe at once. They also apply in a primary way to all human activity. Any *idea* is translated into a *form* through a *routine* of activity, from procreation to building a house or driving a car. They apply to any idea of any human being or any intelligent creature anywhere.

Since the universal hierarchy of term 1 is *discretionary* not any *Routine* will do. Even electrons are not free to roam in random orbital *routines*, for they are part of one, coherent, highly ordered creation. Quantum numbers are a reflection of the cosmic order that implicitly imposes a regimen upon events at the atomic level. Term 1 works in conjunction with term 3 by selecting the quantized elements of technique that are needed in the ongoing projection of the cosmic movie.

The *step-like progression* in the universal term1 from C1 to C2 to C3 designates a process of transformation in a time-like way. As pointed out before the progression takes place in discrete steps. These steps involve the active *Routine* of transforming to the alternate subjective orientation, term 2, where the *Idea* assumes a specific *Form*.

The universal set transforms from the objective orientation term 1 to the subjective orientation term 2 by the *perceptual transposition* of UC3, the proton or *form* interface. This is the inverse perceptual transposition of the corresponding particular set. As shown in Figure III-4 the particular term 3 transforms to term 4 by the transposition of the photon *idea* interface, PC1. This implicitly requires that the *form* of the particular photon energy shell must relate to the closed *forms* of the electron and proton in a manner consistent with the universal *form* of all atoms.

The *countercurrent identities* of term 2 are illustrated by the relational wholes  $R_1$  and  $R_2$ . They relate the *Idea* to the *Form* through the *Routine* and there is feedback from the *form* to the *idea*. In  $R_1$  the subjective *Idea* behind the *Routine* lends it direction as it relates objectively to the *Form* and there is countercurrent feedback  $R_2$  in the opposite direction.

We are familiar with this in human activity. If we are making a vase on a potter's wheel the *idea* of the vase directs our *routines* that give shape to the *form* of the vase. And we get countercurrent visual feedback until we see that the *form* of the vase matches the *idea*.

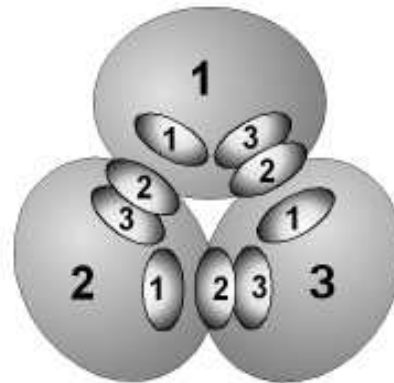
There is a physical correspondence to this countercurrent process in the way the photon, electron and proton mutually interact as separate centers within the atom. An examination of the space-frame side of Figure III-3 shows that each of the three closed particulate centers has three universal centers confined within it, as the latter intimately link up the former. Within the proton, represented by the particulate center 3, there are two universal centers that relate in one direction to the photon (UC1 and UC2), and one universal center that relates in a different direction to the

electron (UC3). There is a direct correspondence here to the two up quarks and one down quark that universally characterize all protons.<sup>17</sup>

Quarks are thus perceived, not as fundamental particles, but as three open universal active interfaces that reinforce closed particles in their double subjective to objective identities in each triad set. In System 3 there are three universal interfaces active within the particular photon and electron as well, but in a way that reinforces their relationship to the central Form of the proton.

This interpretation is substantiated by the regenerative role of the neutron illustrated in Figure III-6. The neutron has two down quarks and one up quark because the electron *routine* interface has perceptually transposed to contain the proton *form* interface and relate inward to the photon *idea* interface.<sup>18</sup> This relates the form of the proton to the photon which effectively collapses the photon energy shell of a neutral atom. In a later part it will be shown that this effectively condenses space and time by 15 orders of magnitude.

Figure III-6 has been simplified to clarify features of the regenerative mode. The countercurrent relational wholes  $R_1$  and  $R_2$  of the universal set have been omitted. The direction of flow is still indicated by the light gradient within each of the universal centers that link up the large particular centers. The universal set is shown as small ellipses that tunnel across the boundaries of the particular set. Note that center 2 is perceptually transposed to contain center 3 and relate directly to center 1, thus binding the particular set together as form. Compare with Figure III-3.



## The Neutron

Figure III-6

As mentioned before antimatter involves the reverse clockwise linking up of the particular sets by the universal set. This degenerative mode of System 3 has the effect of reversing charge.

Although it also possible for particle accelerators to produce other particles that are transient homologues of System 3, they are highly unstable. Other fleeting “resonances” possible in high

<sup>17</sup> The quark-lepton analogy associated with the electron may relate to the fact that both electron and proton are mediated by inverse relations with the photon, consistent with the countercurrent identities in the universal set.

<sup>18</sup> The views of Murray Gell-Mann, the father of quark theory, are inconsistent with those expressed here. In quantum theory quarks are conceived as entities having specific independent mass in a kind of internal quark space, all quarks of a kind somehow managing to be identical for unexplained reasons. Universals can't rightly be ignored by tacitly assuming them in another disguise. Science generally denies universals as transcending influences operative either in the nature of matter or in living biological processes. There are exceptions, however. For example Murray Gell-Mann appeals to unity in diversity themes in addressing social problems and our human need to cope with macroscopic complexity. Murray Gell-Mann, *The Quark and the Jaguar*. NY: WH Freeman, 1994.



energy collisions tend to reflect symmetries of Systems 4 and higher. This does not mean that they are fundamental building blocks of atoms. On the contrary, the System indicates that they are highly transient phenomena of a higher order.

### **The Regenerative Mode and Neutrons:**

Apart from anti-matter the neutron is the only other structural possibility in System 3. The neutron decays into a proton, an electron and an anti-neutrino, although it is quite stable within a stable nucleus. The photon energy shell is collapsed in a neutron to become bound with electron and proton into a single particle.

The sequential order of the universal set is *idea*  $\Rightarrow$  *routine*  $\Rightarrow$  *form*. The reverse sequence makes no sense as a creative activity. As a universal means to activity, *idea* is subjective to *routine*; *form* is objective to *routine*. The *form* of the painting is the creative translation of the *idea*, not vice versa. But given the painting in completed *form*, it can and does evoke the *idea* implicit within it. There is a transference of idea from creator to observer through the medium of the completed painting. In this limited context, Marshall McLuhan may have had a point: "The medium is the message." In a self-similar way the neutron as the *regenerative mode* is specific to the particular context in an atomic nucleus. Outside that context it is unstable.

If we picture the three particular centers of an atom combined together as one in a neutron (compare the space-frame side of Figure III-3 with that of Figure V-1) they effectively lose their independent subjective to objective identities as separate centers. There is no inner space to define them as separate entities as there is in a neutral atom because the photon energy shell has collapsed.

When the universal *routine* interface, center 2, does a *perceptual transposition* it contains center 3, the *form* interface, within it. In thus transposing the *routine* interface faces backward, internally, toward the universal *idea* interface. The proton *form* is thus fed back as a unifying *idea* that binds the photon, electron and proton as one single particle. There is a photon binding energy required associated with the anti-neutrino when the neutron decays. This corresponds to the weak force or weak interaction in traditional physics.

This mode of a space frame set will be called the *regenerative mode* of System 3. It involves the nature of unity in conjunction with the *expressive mode*. It occurs only in connection with the *expressive mode* within the context of the *evolutionary* variant of the creative process. Neutrons are thus found to occur in the fusion of heavier elements. We will return to this in Part V.

In the neutron note again that the perceptual transposition of center 2 has turned one of the so called *up quarks* into a *down quark*, so that the neutron has two downs and one up, consistent with quantum theory. Since the binding energy that brings the three particles into intimate contact must occur within the context of a nuclear fused form, the neutron is unstable outside the nucleus. In  $\beta$ -decay the reverse perceptual transposition transforms a neutron back to a hydrogen atom through the quantum frame.

In a free neutron an anti-neutrino is released to preserve momentum. This can be seen as a particle remnant of a photon since the *routine* electron interface reverses its orientation from the photon back to the proton. The energy released in the neutron decay is ample to eject the electron beyond the ionization limit of an atom. If the decay takes place in the nucleus of an atom the proton produced may remain in the nucleus increasing the atomic number by one.

### Summary Observations:

System 3 delineates the structural dynamics of the *primary activity* as a universal pattern inherent in all activity. It provides a universal methodology that complements traditional approaches to the sciences. System 3 relates especially to the physical sciences. Since this introduces a radical departure from currently accepted methods, a few general observations may help to clarify some points of departure.

- 1) System 3 is generated by two sets of three active interfaces or centers. One set is universal and one set is particular representing many of a kind. The two sets cohere together in alternating objective and subjective orientations.
- 2) The oscillating orientations of System 3 constitute a succession of particulate *space-frames* that define linear time, alternating with *quantum frames* that are quantum constituents of the formless and timeless Void. The Void is an eternal memory bank, or *quantum sensorium*, spanning and integrating the whole of history. It is orthogonal to the integrated fabric of space-time.
- 3) Each particular space-frame delineates the structure of a primary hydrogen atom that defines the spherical inner space of the atom distinct from the linear external space between atoms.
- 4) There is no particulate motion in a space frame, only electromagnetic activity. All relative motion occurs as quantum jumps in position between space frames. Relative motions between atoms introduce relative space frame skipping which accounts for relativity effects. A quantum-relativity emerges naturally.
- 5) Since all light is emitted from processes within atoms it defines external linear space orthogonal to the inner spherical space of each atom. The speed of light is universally constant because light itself defines space with respect to each atom independent from relative motions.
- 6) Synchronous distortions result from patterns of relative motions, accounting for electromagnetic and relativistic effects. Since space and time are quantized relative to each atom, relative space frame skipping due to complex patterns of relative motions in the heavens introduce a variety of effects. A new approach to cosmology results from the need for a preponderance of synchronicity in the universe as a whole.
- 7) System 3 is not consistent with the spacetime continuum assumed as fundamental to general relativity. Curvatures in the integrated fabric of space-time result from patterns of relative space-frame skipping due to angular motions. Relative space-frame skipping is generally consistent with the effects of special relativity, albeit from a different perspective that acknowledges universal influences, including quantum correlation.
- 8) The System is not consistent with a Big Bang origin, since it is not consistent with a spacetime continuum and other assumptions essential to that theory. A new *quantum relativity* emerges with System 3, which has relevance also to subsumed biological and social systems of order.
- 9) The System acknowledges more than one kind of identity. Conjugate identities are clearly distinguished from Aristotelian identities and triadic identities. There are many profound implications involved in reinterpreting mathematical identities.

- 10) System 3 prescribes a coherent perspective of a discontinuous but synchronous universe. This requires that there is a minimum limit to the increment of the differential in the calculus. Quantum correlation and the uncertainty principle are associated. New methods are required that take cognizance of these phenomena.