

**Overview of Sankhya theory with axiomatic mathematical proof**

*A correct theory should be simple, logically & numerically consistent and be in consonance with reality. It should be based on an axiomatic foundation, so that the principle of causality is not violated. The permanent foundation for a unified theory that defines all phenomena, at every point in space and time, must be a non-dimensional and scale-invariant formulation, if it is to fulfil the criteria of universality. In a unification paradigm, it is necessary to restrict the controlling parameter to a single variable, if it is to be effective mathematically. From an intellectual, logical and observational standpoint time or the interval between activities is the only parameter that can fill the role of a controlling parameter. The definition for the real and substantial nature of the substratum on which phenomena is based should evolve from within the theory as a consequence of its axiomatic foundation which consequently compels the inclusion of dynamic interactive states.*

*The intellectual dichotomy posed by the ordering of polarised concepts such as “maximum and minimum”, “static and dynamic”, “start and finish”, “left and right handedness”, “simultaneous and sequential”, etc. should be resolved through an axiomatic unification paradigm, again arising from within the theory. Simplification of logic, rigor of analysis and elimination of conundrums must form a vital part of the derivational process to establish integrity of theoretical conclusions. Since Universal phenomena existed long before the advent of human life, a correct theory must not depend on logic structured through intellectual analysis that is contrary to the observed characteristics of natural phenomena. A classical example of a conundrum in Physics and Cosmology is the assumption that space is a vacuum, void or devoid of substantiality because of the failure of experiments to detect the presumed characteristics of space.*

*Further, since the theoretical derivation forms the foundation for pursuing human activities efficiently, it must be amenable to observation and practical verification, for only then its utility would be confirmed intellectually. The process of verification through observation depends on a relative change which restricts its means to a dynamic parameter such as time. The proof for the completeness of a theory should rest on the unequivocal corroboration of its theoretical derivations, with every type of observational experience which naturally forms an element of physical reality.*

*As a specific case, the spectrum of phenomena observed in parapsychological and spiritual domains have been widely reported through verified firsthand accounts, yet there is no place for it in current science, even as a hypothesis. Lastly, since the theory is based on axioms, its proof must be generated from within as a part of its derivational process and should not depend on arbitrary or external observational parameters. A rigorous test for the correctness of a unification paradigm lies in its ability to derive numerical solutions unambiguously, without dependence on constants that are structured through tenuous logic. The removal of uncertainty as a factor and establishment of the accuracy and correctness of a unification paradigm compulsorily leads to the concept of predestination as an operating parameter in reality.*

*The foregoing criteria form the derivational base for the unified field theory of Sankhya, (logic of counting in Sanskrit), created by Maharishi Kapilla in a pre-Vedic period. Sankhya forms the core of the Bhagavadgita, embedded in the Mahabharata. Based on the foregoing principle, its axiom based foundation, bound by rigorous logic, using combinatorial mathematics, inexorably leads to an austere formulation which is the epitome of intellectual elegance. It is the only unified field theory in existence that offers a complete scientific*

and mathematical solution to every aspect of reality, manifest or unmanifest, in space comprising substantial components. The 68 Sanskrit axiomatic theorems or sutras in Sankhya are transliterated, along with its mathematical derivations in part 2, for the first time, as all earlier translators could not decipher its scientific content based on combinatorial mathematics. While it may seem impossible to present a complete theory of manifestation of all forms of universal phenomena in just 68 theorems the ingenious method of presentation justifies its correctness. In the very first sutra or theorem a method of elliptical negation gives the clue to deriving factorial 68 numbers of solutions combinatorially from as many theorems. The logical derivational process is presented below but the comprehensive mathematical proof is given in appropriate chapters which gives simple explanations with mathematical proof for the numerous unexplainable anomalies in Physics and Cosmology. For instance the well known EPR paradox, Hubble's expanding Universe hypothesis or the unidentifiable spectrum of dark matter / energy phenomena are shown to be the product of misunderstanding the real structure of space.

Space as a large volumetric entity can be defined and described logically and simply but the introduction of dynamism that has been observed for eons needs a more rigorous approach. In Sankhya, counting interactive events between adjacent components, comprising the continuum of space, provides the means but it depends on a ratio of change that involves an interval, defined in Physics as 'time'. Additionally, any cycle of interaction between any two objects has three complementary phases, in which there is a 'compressive collision', a 'rebounding reversal' and an 'expansive separation'. All these three modes too are governed by the cyclic interval of time but again defined in three complementary phases, as a 'simultaneous instant of collision', a 'resonant period of reversal' and a 'sequential interval of separation', respectively. Colliding interaction creates compressive stresses at the point of impact. In the resonant interval, compressive stress reverses to become an expansive one. The sequential expansive stage initiates the transmigration of interactive stresses that expand beyond its boundary, to other components forming the continuum of space. The three states of the interaction within a single cycle occur as a simultaneous event. However, when the interaction expands to form the sequential transmigrating state, each cycle consists of a repetition of the simultaneous state. The equality of the algebraic sum of the interactive or alternating interval leads to a perpetual harmonic oscillatory state (PHO) that sustains eternal dynamism and is the hallmark of the unification paradigm in Sankhya. The controversial and oft debated phenomenon of zero point energy is given an axiomatic mathematical foundation through the PHO derivation. The Perpetual Harmonic Oscillatory state is defined in Sanskrit as the Tri-Guna interactive states that are the cause of all phenomena in the Universe and forms the principle and singular theme in Sankhya. The axiomatic derivation of the eternally dynamic state through combinatorial mathematics is unique to Sankhya and it raises it to the acme of unification of phenomena in science.

As a preview of a PHO state a physical example will explain how such a state can exist perpetually. An archer's bow is the iconic model of the PHO state. The shaft of the bow is a flat long strip made up of a rigid material like wood or metal. When it is bent the outer curve stretches while the inner surface compresses at the same time and will spring back to its normally straight position of the bending pressure is removed. If a string is attached to both the ends when bent, it would resonate or vibrate as it is stretched and relaxed by the twin pressure form of stress of compression and expansion of the inner and outer layer of the bent strip. Depending on the rigidity of the strip and the elasticity of the string it would reach a balanced resonant state and remain in that state forever. An amplifier with a microphone attached to the bow at its mid stable position would reproduce the resonant frequency at an audible level. Unless the strip or string changes its state the sound would be produced perpetually and has been tested successfully. The key characteristics that make it possible is the rigidity of the strip where the compressive and

expansive state is created simultaneously due to its degree of rigidity and the ability of the string to maintain the same tension as a creating a vibrating rate that is constant.

Theoretically, an instant would be defined in Physics as an infinitesimally small interval of time approaching zero. However in reality the instant of time must have a relative but discrete numerical value. The concept of the instant of collision can be understood simply, as the interval of time a solid object takes to transfer an impact from one side to its opposite one. Stating it differently, if a solid object is pushed from one side, the opposite side would seem to move at the same moment, depending on its rigidity. If the rigidity or density of the solid object is at its maximum, then that interval of time would be the minimum, forming an instant, because there would be minimal distortion. If two such similar objects collide, that interaction would take place within the same interval of time of an instant. There would neither be an interval smaller than that instant nor any distortion that could increase it. Consequently, the action of both objects within the instant must be defined as a simultaneous one. Simultaneous interactions between many objects get merged into a single count, as it occurs within the 'instant cycle'. The simultaneous collision in an interaction is countable. Hence counting interactions are real events whereas the interval in terms of time is a relative comparison. Hence counting as a process of evaluating phenomena is certain and accurate. As an example if the difference between initial time as  $T_0$  and final one as  $T_f$  as  $T_f - T_0 = 0$  the ratio  $T_0/T_f = 1$  is a statement that implies that the comparison is at the same instant and is confirmed by the interval  $T_f - T_0 = 0$ . Hence the test for simultaneity of events is confirmed by two modes as the zero time interval or the ratio of the two being 1. The ratio of infinity/infinity also equals 1 conceptually; thereby allowing the observer to create unlimited variable ratios provided the sum is one. Whereas, time is a relative parameter and therefore, it is not a real but subjective process. There is a similar concept in Physics where waves of different frequencies superposition to decrease the interval of time separating two adjacent ones and when that interval becomes zero the concept of waves, changes to a continuum. In the case of a quantum counting in terms of an arbitrary interval as a second is relatively accurate but is not a definitive or certain process because there is no way of detecting the count as a single or a merged unit.

However, experience shows that sequential interactive events can be counted, because an interval of time separates two adjacent activities, but not those that occur simultaneously or within an instant. Ten claps can be counted as such if it occurs one after another but if all ten occur at the same instant it can be counted as only one. It causes an anomaly of nine vanishing counts when interactions synchronise to act simultaneously. Though the nine merged counts are not countable, it increases its intensity as the hidden clap-count density, within that single clap. Therefore, the number of interactions that take place simultaneously, within the time-interval of an instant, indicates its count density per 'instant of time-interval', whereas sequential ones indicate the number of such instants existing between interactions. Similarly, the moment of changeover from simultaneous to sequential interactive interval covers the 'resonant period of reversal', counted as numbers of such instants. Hence all phases of interactive states can be counted in terms of that instant but not those that occur simultaneously within the instant. There is no detectable method of separately identifying merged or superposed interactions but mathematically it can be evaluated by equating density with 'time squared'. The caveat is that such evaluation of discrete density values cannot be treated as separated or sequential events for it is a product of a simultaneous event. The gravitation and magnetic phenomena in Physics belongs to the simultaneously interacting domain and as it is not measurably separately as discrete interactive states the complication arises from the indirect mode of detecting it. The enigma of mass equal to energy/ $c^2$  is a classical example of the foregoing caveat for the mass factor is recognisable only when it has density in excess of unity. Such behaviour is a natural consequence of a substantial composition of space.

During an interaction between two very rigid components, the instant of collision, reversal and separation between the two, marks the transition from the simultaneous to the sequential states. Ratios are valid only if the comparison of two parameters relate to the same instant or moment of measurement. If not the comparison becomes a sequential act where an interval of time is involved. Hence the 'simultaneous state of activity' of two or more components, within the instant, must equal **a numerical ratio** of two similar parameters whereas the 'sequential separation interval' must equal **the sum** of both, as it is not within the minimum interval. At the impact point the simultaneous instant as a ratio must equal the sequential interval as a sum when it is in balance, as shown below

$$1/x = 1 + x. \quad [1.1]$$

This equation can be satisfied by solving the expression for a self-similar interactive displacement interval, between two components as an axiomatic value  $1+1=2$

$$x = \left[ \sqrt{1+2^2} - 1 \right] / 2 = 0.618034 \quad [1.2]$$

Then

$$1/x = 1 + x = 1.618034 \quad [1.3]$$

On transposing  $x$  it becomes

$$1 = x + x^2 \quad [1.4]$$

Raising it as powers as simultaneous ratios, it changes to

$$x^n = x^{n+1} + x^{n+2} \quad [1.5]$$

Continuing, as the sum of infinite powers of  $x$  with  $n$  equal to infinity, it forms a loop as [1.3]:

$$\sum_1^{\infty} x^n = 1/x = 1 + x \quad [1.6]$$

Finally, the combinatorial sum of the sequence of powers of  $x^n$  to  $x^{n+n}$  equals one, as a super-symmetric series with combinatorial coefficients  $a, b$  etc forming the Pascal triangle, shown below as an example :

$$x^{n+0} + \binom{n}{1}x^{n+1} + ax^{n+2} + ax^{n+n-2} + \binom{n}{n}x^{n+n-1} + x^{n+n-0} = 1 \quad [1.7]$$

The above sequence [1.7] enables the identification of self similar and scale invariant ratios which form a coherent volume as in nuclear, black-hole, bounded or similar agglomerate states in asymptotic freedom in Physics, that act as one single unit or simultaneously.

The above sequence of derivational changes form an extraordinary and unique logical-loop, based on combinatorial values. It defines the characteristics of self-similarity and scale invariance which exists at the instant of collision & separation, between two adjacent components. The interactive phase of compressive collision being smaller, it is denoted by  $x^2$  and the separation interval being larger, is similarly denoted by  $x$ , leading to the period of reversal as:

$$x - x^2 = x^3 \quad [1.8]$$

Therefore, the compressive displacement interval after, adding  $x^3/2$  is:

$$x^2 + (x^3/2) = 1/2 \quad [1.9]$$

This is equal to the expansive phase, after subtracting  $x^2/2$ , as:

$$x - (x^3 / 2) = 1/2 \tag{1.10}$$

Since both the compressive and expansive intervals are equal, the algebraic displacement is zero and the interactive point must remain at the centre, if all the interactive parameters do not change. Hence an unique combination of interactive states exist that act simultaneously at the  $1/2$ ,  $x$  and  $x^2$  locations, forming the source of a holographic state. Further, the asymptotic sum of the interactive ratio  $1/2$  approaches 1, confirming the consistent location of the collision at the centre, even at higher interactive count-rates, where  $n$  is the indicator of density count of interactions at the same location:

$$\sum_1^n 1/2^n + 1/2^n = 1 \tag{1.11}$$

The foregoing derivation lays the foundation for the principle of self-similarity and scale invariance but the rigorous mathematical proof is derived in a later chapter. The axiomatic value of a cycle is obtained by adding  $x/2=3.09017$  iteratively with  $1/2^n$  combinatorially through the expression:

$$A_{n+1} = \sqrt{\left[1 - \sqrt{1 - (A_n)^2}\right]^2 + [A_n]^2} \dots \text{where} \dots A_0 = x/2 \tag{1.12}$$

This leads to an axiomatic cycle of 10 interactions as  $n$  approaches infinity while ratio of diameter to circumference reaches the limiting value of  $\pi$ .

The equivalence of coherent states to synchronous states is equated through rewriting the above as follows:

$$\pi / (2^n A_n) = 10 \dots \text{when} \dots n \rightarrow \infty \tag{1.13}$$

$$\frac{1}{2}^n = A_n \left(\frac{10}{\pi}\right) \dots \text{or} \dots 2^n A_n \left(\frac{10}{\pi}\right) = 1 \tag{1.14}$$

Axiomatically, a resonant interactive cycle is limited to ten interactions for the cosine of the angle at 36 degree interval is  $(2\pi / 10) = 0.809017$  equal to half the golden mean as  $1.618034/2$  and is totally in consonance with the derivation above. Hence a simultaneous cycle of 10 interactions can be presented as a logarithmic index of one. Therefore all numerical values in Sankhya are presented as a mathematical code with the logarithmic index to the cyclic base ten, (not decimal) which was the prime reason earlier translators failed to do justice to the extraordinary theory. In order to be transparent to the scientific reader the constants as ratios are normally derived at the relevant sequences in science whereas in Sankhya it forms the preliminary sequence from which larger ratios are derived axiomatically.

The number of interactions taking place simultaneously within the instant cycle defines the intensity of its activity or density of interactive counts. The maximum density of interactive counts and the minimum interval of time as the instant, form an inversely proportionate ratio leading to an axiomatic, numerical constant  $Kx$ , in Sankhya. Though the interactive colliding point remains at ratio  $1/2$ , the constant  $Kx=0.9149879$  defines its boundary limit as an asymptotic sum of combinatorial number of simultaneous interactions forming the instant and is a conceptual equivalent to Catalan's constant in mathematics.  $Kx$  is a pivotal factor in Sankhya and is derived through axioms as shown below..

$$Kx = \frac{10^{1+x}}{2^3} \frac{2^{1/3}}{2^3 - 1} \frac{10^2 - 2}{10^2} = 0.9149879 \tag{1.15}$$

The interactive count rate rises to  $C$  when the colliding interaction reverses to expand or when the simultaneous state changes to a sequential one as in [1.8], as an expanding ratio of  $2/x^3$ :

$$C = 10^{2/x^3} = 296575967 \quad [1.16]$$

The constant  $C$  is the axiomatic count rate of interactions per cycle between the components comprising space, following the self similar and scale invariant rules of proportionality of simultaneous ratios as defined in Sankhya. The count rate or frequency of a meter wavelength of an EMW or light wave as measured by Michelson & Morley is a close 299792458 but there is a profound reason shown further on.

The interactive count rate rises to  $C^x$  on the compressive part of the cycle and falls to  $C^{1/x}$  on the expansive phase.

$$C^x = 10^{2/x^2} = 172213.....C^{1/x} = 10^{2/x} = 1722. \quad [1.17]$$

The factor  $C^x$  acts as a merged simultaneous group within one interactive cycle and is the stress count density which transmigrates, as a set  $C^{1/x}$  times to total  $C$  counts in a cycle such that the displacement upon period is always  $C$ . Its interactive density rises and falls cyclically that creates an accelerative state or force following principles of self similarity.

[It will be shown later that  $C^x$  forms the magnetic potential and its transmigratory rate is not limited whereas  $C^{1/x}$  forms the sequential electric current limited by a transfer rate of  $C$ . The magnetic current or transmigration of simultaneous interactions, like gravitational acceleration is not restricted or obstructed whereas the transmigration of an electric current needs a connected path for it to be sustained]

Time is not a constant in space like the second in Physics. Since  $C$  is an axiomatic constant of an interaction between two adjacent components, thus forming the axiomatic clock of constant cyclic rate. Therefore the constant  $C$  sets the ratio of length upon interactive displacement the reciprocal of which gives the rate per unit interval related to the observer's standards of measuring rod and timing clock. Hence it depends on the observer to set whether length, displacement or time is kept as a constant to derive its mutual proportionality related to the rate constant  $C$ . However, in Sankhya, there is no alternative to counting interactions as the method of deriving theoretical propositions, because the axiometrically derived  $C$  is a universal constant.

In the foregoing derivation the interactive cycle is balanced where the compressive and expansive stresses are equal within that cycle, simultaneously. It leads to profound consequences shown later. In a self similar and scale-invariant resonant cycle the interactive count must be constant. If that count rate changes, interactive density per cycle changes thus initiating transmigratory movement involving change in the displacement interval or time

The simultaneous count rate balances, maximises or minimises into a unit count, depending on the algebraic sum of the logarithmic index.

$$10^{1/x^3} = 17221.....10^{1/x^3 + 1/x^3} = 296575967.....10^{1/x^3 - 1/x^3} = 1 \quad [1.18]$$

At an interactive count rate of 17221 or  $C^{1/2}$ , the compressive and expansive states are equal and the algebraic sum of the interactive count is zero, leaving the interactive components in space in balance and at the same location. However if the balance is upset for any reason, the  $1/2$  will change to a compressive increase  $x$  as  $C^x$  and expansive reduction  $1-x$  as  $C^{1-x}$ . The compressive to expansive ratio counts change by 100 or two simultaneous cycles ( $\log 2$ ) thus causing a delay in the constant cyclic rate. As shown below the difference between compressive and expansive phases of the interactive cycle is  $D_c$  as  $C^x/C^{1-x}$ :

$$D_c = C^x / C^{1-x} = 10^{2/x^2} / 10^{2/x} = 10^2 = 100 \quad [1.19]$$

The delay  $D_c$  of 100 interactive cycles is in the sequential state caused by the collision of two components in one direction that would occupy space as two volumetric entities. Hence the displacement interval would have increased in all directions by the ratio of cube root of 2 or the ratio equals  $2^{1/3} = k = 1.259921$ . Hence the incremental ratio becomes  $(k-1) = 0.259921$ .

Therefore the delay  $D_c / (k-1)$  form a ratio with a loss of two interactions per cycle, as the delay in transmigration of the interactive cycles in space as  $S_i$ :

$$S_i = \left[ 10^2 / (k-1) \right] \left[ \left( 10^2 - 2 \right) / 10^2 \right] = 377.0376 \quad [1.20]$$

*At  $C^0.5$  the balanced count values maintained the point of collision in the same location whereas at  $C^x$  the delay  $S_i$  shifted the location to another point. Assuming the same unbalanced state prevailed, the point of collision would shift after every interaction, proportional to  $S_i$ , initiating transmigration of interactive counts, in dual states of compressive counts of 172223 simultaneous or merged cycles and expansive counts of 1722 sequential or separated interactive cycles. However the total interactive counts would total to  $C$  in every cyclic period. The expansive counts being smaller it would create the shift of the colliding point in that direction. The delay or impedance to the transmigration of interactive counts as two types of stresses in space occurs only when there is an accelerative displacement that causes the break-up of the simultaneous coherent state to crossover to a sequential resonant state. It transfers the added stress count to the adjacent component as a transmigratory process. The  $S_i$  count per cycle as impedance would be effective and detectable only when transmigration is initiated by breaking the coherent state of root  $C$ .*

In space the interactive oscillations among the components are volumetric or three dimensional in effect. Therefore the interactive count in all three axial directions would be  $C^3$ . However, in a coherent interactive state all the oscillations would act simultaneously and synchronously whereby two axes would merge and its interactive counts would reduce to  $C$  by merging within one cycle count interval. But the entire surface area would oscillate in the breathing mode creating a unified surface area or flux of stress. Hence the detectable count rate of the coherent volume would only be  $C$  but the merged and hidden surface area count as  $C^2$  would initiate the oscillatory transmigration of stresses in both the compressive and expansive mode. The changes in stress count densities would initiate accelerative transmigration in both the simultaneous and sequential modes. The inward displacement would increase stress density and counts would merge, while the outward expansion would decrease stress densities to increase counts that cause detectable transmigratory displacements.

The volumetric compressive phase density count would be  $(C^x)^3$  and  $(C^x)^2$  its expansive area flux density count, while  $C^x$  would be the axial linear phase. Similarly  $(C^{1-x})^3$  would represent the relative volumetric expansive count density,  $(C^{1-x})^2$  its expansive flux count while  $C^{1-x}$  would equal the decrease count due to expansion in any axial direction. However, the product of compressive and expansive phases would equal  $C^3$  as volumetric,  $C^2$  as area and  $C$  as linear interactive values respectively. Only Transmigrating interactive counts would create stresses of both types and its reactions would be detectable as force, acceleration, etc.

Stress transmigrates through an interactive cycle of compression and expansion. The period of reversal impedes the stress count transfer rate proportionate to  $S_i$ . In the compressive phase  $C$  is increased as  $C \cdot S_i = C_c$  and in the expansive phase it is reduced to  $C / S_i = C_e$ :

$$C_c = C \cdot S_i = 1.1182E + 11 \dots \dots C_e = C / S_i = 7.866E + 5 \quad [1.21]$$

The product of  $C_c$  and  $C_e$  equal  $C^2$  as the simultaneously oscillating surface and these merged interactive counts cannot be observed but the accelerative changes can be detected and measured as a force. The changes from compressive to expansive or simultaneous to sequential states are carried out over a displacement distance ratio of  $(k-1)/1$  in a cycle of  $C$  counts and causes a shortfall in the stress transmigratory distance covered in that period as:

$$DI = [k - 1] / C = 8.764E - 10 \quad [1.22]$$

*DI is a relative ratio and if C is defined in metres/second then there would be shortfall in the distance covered by transmigration of stresses over that period of time.*

*In electromagnetic theory in Physics the reciprocal as  $1/Cc$  is defined as the electric field permittivity  $\epsilon$  and  $1/Ce$  as the magnetic field permeability  $\mu$ , in free space.*

$$\epsilon = 1 / Cc = 8.847E - 12 \dots \dots \mu = 1 / Ce = 1.258E - 6 \quad [1.23]$$

*The Sankhyan derivation above simplifies and unifies all phenomena which are only due to the interactive state of the components in space. C is the number of interactions per simultaneous cycle comprising 10 interactions which is the axiomatic self similar 'instant interval' of a cycle. It is approximately equal to the experimentally measured frequency of an electromagnetic wave of 1 metre wavelength, if the duration of that cycle is a second. The difference between it and the experimental value of CL=29979258 are due to a shift in frequency that is 'logarithmically proportional to distance' in a gravitational field, as Fc, with the Solar boundary radius RS=6.985E+8 and the orbital radius of Earth Ro=1.491E+11 in metres:*

$$Fc = 10^{Rr/Ro} = 1.0108455 = CL / C \quad [1.24]$$

*The above distance related ratio would be applicable to every case of measurement of rate of interactive stress transmigration. The foregoing confirms the Sankhyan derivation that all electromagnetic waves, including light and gravity waves, are interactive stresses created between the components forming the substratum of space and transmigrate from a higher to a lower stress count. The resonant interactive stress in space is at a self-similar and scale-invariant oscillatory rate of C per simultaneous interactive cycle formed by 10 such interactions. If the wavelength and time cycle of a light wave is set at a metre and second then the frequency of the measured light wave CL would be higher than the rate C.*

$$CL - C = 3.2165E + 6 \dots \dots CL / C = 1.01084548 \quad [1.25]$$

*It is based on an axiomatic logic that stresses in any physical medium must always transmigrate from a higher to lower count and in space the interactive rate gives the intensity of these stresses. Therefore C is the perpetual interactive rate and any transmigration of any type of stress must have a higher rate than C. {The observed Cosmological red shift is a conceptual error as CL is much higher than C, because the Sun is the closest light emitting body. Since the light from every stellar source is further than the Sun, it must have a lower count value than CL but higher than C. } Therefore Fc must be the largest blue shift for observers on the earth. Similarly there will be a frequency difference on every planet. The interpretation of Hubble's finding that space is expanding is axiomatically impossible in space comprising substantial components. However the numerical value of Hubble's red shift with distance has a logical explanation. The entire spectrum of such shifts are derived theoretically and tabulated in a later chapter. Similarly DI will show a meter shortfall in approximately 36.15 earth years if the wavelength of light is set to C in meters / second. It has been observed experimentally as 'the Pioneer anomaly' where the estimated position of Pioneer in orbit and interval of electromagnetic signal reception time did not match and it was observed to progressively increase with distance.*

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forming the instant and is equivalent to Catalan's constant in mathematics.  $Kx$  is a pivotal factor in Sankhya and is derived through axioms in a later chapter.

In Sankhya, the concept of deriving a non-dimensional and scale-invariant theory is fulfilled perfectly by defining the instant numerically through axioms, because all phases of a fundamental interaction can be counted in terms of it. A colliding impact between two objects gave the principle of identifying both the instant and its intensity through the simultaneity of action. In three-dimensional space, the maximum number of simultaneously colliding interactive events between elemental objects is limited to six, as the top, bottom, front, back, left and right sides of an object. Earlier, a simultaneous interaction's intensity or density was specified in terms of the number of interactions within that instant.

Then in principle, taking the numerical rate of interactive counts as  $C$  in each of the six direction, its intensity or simultaneous count density at the point of collision becomes  $C^6$  and its relative instant, the Moolaprakṛity in Sanskrit, as  $Mly = Kx/C^6$ . In Sankhya all derivations are strictly dimensionless numerical interactive stress count ratios in terms of  $Mly$ , which is the instant of time in an interactive cycle of ten simultaneous counts. Stating it differently, a circular and recurring displacement path can only be maintained by ten self-similar interactive intervals forming a cycle. Therefore the complete mathematical derivation of the entire manifestation process is based on the principle of only counting interactions that indicate discrete changes in cyclic time.

Applying the numerical value of  $C$ , the ratio of the simultaneous instant in dimensionless form is  $Mly = Kx/C^6 = 1.344620Eminus51$ . The axiomatic derivational concept and the numerical value of  $Mly$  is new to science but is approximately equal to Planck's constant  $h/C^2$ ; hence is consistent with values in Physics. Contrary to the practice in Physics, the oscillatory rate  $C$  in Sankhya is measured against a self-similar and axiomatic cycle of ten of its resonant interactions forming the simultaneous instant or ten sequential interactions within the cycle as instant of time and is not an arbitrary interval like the second. The procedure above leads to self-similarity and scale-invariance, which factors are vital to sustain a unified law of manifestation at all levels. Reiterating, the dimensionless ratio  $Mly$  is the minimum cyclic interval, when two objects collide at the maximum interactive stress density and components in space act as a continuum within that interval.

Logically, unless the numerical count of 'sequential interval of separation' is greater than the 'simultaneous instant of collision', the interaction among the components in space cannot be counted or detected. Only a discrete change in time could be detected but when both the simultaneous and sequential intervals are equal, there would be no difference. In a balanced state both intervals remain equal. Hence space must remain undetectable. It is the main reason why all efforts to detect space (as aether) failed totally, despite numerous intricate experiments carried out by Michelson, Morley and several others. Since  $Mly$  forms the unit count, the interaction can become detectable only when the sequential interval increases to  $Mly + Mly = 2Mly$  counts, but there is a caveat.

When the ratio of the instant to sequential time-interval becomes one by two or half, a state of resonance is initiated among the components in space. The equations [1.1] to [1.14] spell out the rationale of how and why an interactive resonant rate is initiated and maintained in a sea of components forming space. Stating it simply, when continuous interactive vibrations or oscillations between two components remain in the same location it is a state of resonance. When two similar objects vibrate resonantly at the same rate between two constraints separated by some distance, the colliding point will always remain in the middle of the distance. When resonance is broken the meeting point would shift progressively towards a lower interactive count rate. Interactive stresses would begin to transmigrate beyond the point when resonance breaks and creates harmonics.

Reiterating, the only reason stresses transmigrate is due to a difference in the interactive count rate from the resonant constant rate of  $C$ . Interactive stresses transmigrate from a higher count rate to the resonant rate  $C$  and is absorbed into its simultaneous state of interaction. The commonly observed mechanism of temperature transfer occurs for the same reason but at another density level, to equalise oscillatory counts and reach thermal equilibrium. A  $Mly$  ratio of  $1/2$  created a resonant state in one direction in which two components in the substratum of space interacted simultaneously as a single entity thereby reducing the stress count at the colliding central location. In a three dimensional continuum the stresses in a resonant state would transmigrate inward from all six directions as top, bottom, right, left, front and rear to regain balance. Hence 8 components would be confined by the inwards transmigration of stresses towards its centre where the resonant interactive counts would reduce by merging, in attaining the simultaneous state. The difference in stress intensity or interactive count density will change by a ratio 7 because  $2^3=8$  less the primary state of 1. The acceleration of interactive stress counts towards the centre of the 8 components forming a larger scale-invariant aggregate count would be  $Ab$ :

$$Ab = [(1+1)^3 - 1] / Mly = 7 / Mly = 5.206 E + 51 \quad [1.26]$$

The astronomical value of the interactive count indicates the intensity of stress transmigrating towards the centre of the eight components. It is because all eight units act as a single unit thereby reducing the 8 interactive counts to a single count per cycle by merging 7 counts as a simultaneously interacting state in synchrony with the one.  $Ab$  binds the 8 components together in a simultaneous and resonant state, to display the very first coherent particulate state at maximum stress density. Transmigration of stresses towards its centre initiates the phenomena of gravitation at the very fundamental level where the maximum accelerative stress intensity is  $Ab$ . The value of  $Ab$  is in counts of interactions per sequential cycle of 7 expanding volumes. It is self-similar, scale-invariant and dimensionless.

$Mly$  defined the interval in time after which the simultaneously interacting continuum changed to a sequential state wherein the interactions could be counted as discrete intervals of time that existed between adjacent interactions. As shown earlier, the cycle of ten interactions is equal to  $2\pi$  as a ratio of radius to circumference. In all three directs it becomes  $(2\pi)^3$  which gives the increase in ratio as  $(2\pi)^2$ . Similarly the increase in volume within which the transitions occurs is 7. Therefore the ratio of change per unit radial increase of 7 volumes would be  $Tr$ :

$$Tr = \left[ \frac{2\pi^3}{2\pi} \right] \left[ \frac{1}{7} \right] = 5.6398 \quad [1.27]$$

Similarly, taking the volume increase as 2, the radial displacement becomes  $2^{1/3} = k=1.259921$ , and the incremental or sequential difference is  $k-1=0.259921$ . Therefore comparing these two factors as a ratio of change of 2 volumes, as  $Tc$ :

$$Tc = \left[ \frac{2\pi^3}{2\pi} \right] \left[ \frac{1}{k-1} \right] = 151.8862 \quad [1.28]$$

$Tr$  is the constant that defines the ratio of counts needed to break the coherent state symmetry to change to a resonant state.  $Tc$  defines the ratio of counts that triggers the sequential transmigration process by breaking the coherent volumetric state into harmonically resonant states. As defined earlier, in the coherent state the  $Cc$  and  $Ce$  oscillatory state maintains the area parameter as  $C^2$  in synchronisation and therefore  $Tc$  is needed to break that large value. The mathematical formulation of breaking the synchrony is shown further below, after the derivation of the Hadron / Lepton or Proton / Electron states from first principles.

The maximum, simultaneous stress count density in all three axial directions is  $Kx/Mly$  and in any one such direction it becomes  $(Kx/Mly)^{1/3}$ . The maximum inward acceleration  $Ab$  will compress interactive stress counts between two components in space into a rigid and dense continuum such that both act as a single unit as  $Lp$ :

$$Lp = [(Kx / my)^{1/3}] / Ab = 1.6896E - 35 \quad [1.29]$$

Extending that logic further the 8 components in space will project a rigid interactive and relative volumetric state of  $Lp^3$ :

$$Vp = Lp^3 = 4.82E - 105 \quad [1.30]$$

Therefore in principle  $Lp^3$  would be the volumetric ratio, with the densest interactive stresses per count, going inward towards the centre of the 8 components forming a single group. Hence the ratio  $Lp$  would be the smallest displacement interval. In order to establish  $Lp$ 's connection with dimensional characteristics in Physics,  $C$  can be taken as the stable axiomatic oscillatory rate per cycle, as in Sankhya. Then  $C$  into  $Fc$  metres as wavelength would equal  $CL$  metres per cyclic second as velocity, confirmed experimentally. Then,  $Lp$  equals Planck Length in metres and  $Lp/C = 5.697E - 44$ , would equal Planck time in seconds. In a dynamic and resonant substratum the axiomatic value of  $C$  must be the stable and constant motivating potential as shown earlier. On converting  $Ab$  to its equivalent value of time in seconds in Physics:

$$Abc = 7 / MlyC = 1.76E + 43 \quad [1.31]$$

The reciprocal of  $Abc$  signifies the minimum time in seconds where two interactions can merge to form a single event and is equal to Planck's time as  $Tp$  or  $Lp/C$ . Reiterating,  $Mly$  is the axiomatic instant of time that separates two interactions at maximum interactive count density, whereas the 'second' in time is defined in many experimental ways but is standardised on the frequency of the caesium atom.

$$Tp = MlyC / 7 = 5.697E - 44 \dots \text{sec onds} = Lp / C \quad [1.32]$$

Stating it differently, at an interval less than  $Tp$  seconds, the components in space act as a continuum as the interactive stress density is at its maximum. Therefore the components in space will behave as a solid or rigid or incompressible object of length  $Lp$  metres in an interactive cycle of  $C$  interactions per second. Acceleration  $Ab$  is also confirmed by the following classical ratios:

$$Lp / Tp^2 = C / Tp = Ab = 7 / Mly = 5.206E + 51 \quad [1.33]$$

If  $Lp$  as the smallest, rigid and coherent displacement changes its stress level to a resonant state, as  $Ne$ :

$$Ne = Lp^3 Tr / Lp^2 = 9.5287E - 35 \quad [1.34]$$

The parameters,  $Lp$  in metres and  $Tr$  in seconds form the smallest length and time interval in space. But  $Lp$  is the length of one side of the volumetric component in space which has a dynamic volume  $Vp$  as  $Lp^3$  cubic metres, in an oscillatory state with the highest interactive stress density. Similarly  $Tr^3$  into  $C^3 = Lp^3 = Vp$  which must be interpreted as the instantaneous ratio of the 8 'component volume' to the cube of the 'interval of time' that yields the value of the simultaneous interactive stress counts, as an axiomatic three dimensional constant. Because  $Vp$  is at the maximum volumetric stress density and rigidity, stresses would tunnel instantly across any number of such units that are directly in a straight line with the accelerating stress. The break in tunnelling creates the  $Ne$  states, depending on stress count densities. Hence  $Ne$  states of various levels, from one to seven, can appear instantly at great distances. Reiterating, the 8 real components in space are bound together by the inward acceleration of stress counts  $Abc$  that merge into a simultaneous interactive state at the centre where the stress counts reduce to a single cycle but at high density.

Therefore, each component in space has a relative volume  $V_p$  equal to  $Lp^3$  and stress count density  $C^3$  in a coherent state where the time is  $Tp^3$  but with  $Tp^2$  merged to give the proportional flux density parameter for the inward accelerating interactive stress-counts at a rate  $Ah$  as gravitational acceleration. The gravitational acceleration as the fundamental and ubiquitous force has the greatest rate in simultaneous interactive states, but reduces in proportion to change in area and is not a the weakest force as surmised in Physics. In fact all other forces have the same mode of action which is that higher interactive count rates transmigrate towards lower ones that have become so through merging. (Recall the 10 clap example as proof).

The coherent combination of 8 components bound by the phenomenal  $Ah$  accelerative stress transmigration towards its centre establishes not only the rationale for the gravitation process but also provides the mechanism for a particulate state formation. The constant  $Kx$  forming the coherent state core boundary value would also increase by the same factor of  $8-1=7$  states. But the incremental value in cyclic time would be proportionate to  $Gm$  as:

$$Gm = [(2^3 / 7) - 1] + 7 = 7.142857 \quad [1.35]$$

$Gm$  is a universal constant that defines the transformation of a volumetric coherent state into a resonant state. Volume of each component as  $Gm/7$  is in a perpetual resonant state as  $R_s$ :

$$R_s = Gm / 7 = 1.020408 \quad [1.36]$$

The cycle of 10 resonant and simultaneous interactive counts would become  $10^3=1000$  sequential interactive counts when the resonant state is broken and the increase in ratio would be  $1000/10=100$  during a period of change of 2 cyclic instants. Therefore the rate of loss of resonance or decay would be the asymptotic sum of the ratio of the difference rates as  $R_s$ :

$$R_s = \sum_0^{\infty} \frac{2^n}{100} = 1.0204081633 \quad [1.37]$$

The factor  $R_s$  ensures that resonance decays in infinite cyclic time or is virtually perpetual. Any comparative equation that equals the ratio  $R_s$  signifies its perpetually resonant status or that the decay in resonance will occur in infinite cycles or time.

The core  $Kx$ , increases to its maximum interactive count level as  $Mp$  in an additional cycle and breaks its coherence to reach a resonant state through the  $Gm$  factor:

$$Mp = Kx(Gm) = 6.536....also....Mp / 7Kx = R_s \quad [1.38]$$

$Mp$  the maximum stress density parameter in a resonant state that equals  $R_s$  and hence it is a perpetual oscillatory state or resonance decays in infinite cycles / time.

On converting it to the time value of a second in Physics, it creates the Planck Mass as  $Mps$  and if 1 cubic metre per second accelerative displacement is equated to a kilogram in terms of a coherent mass:

$$Mps = Mp / C = 2.2037E - 8..Kgs \quad [1.39]$$

The maximum core stress density ratio as Planck density is  $Dp$ :

$$Dp = Mps / Lp^3 = 4.57E + 96..kgs / m^3 \quad [1.40]$$

Similarly the space stress intensity ratio as  $St$  in kgs per second, identified as the metric elasticity of space by Sakharov and Chandrashekhar in Physics is:

$$St = Mps / Tp = 3.868E + 35 \quad [1.41]$$

The stress intensity above has been adjusted to the cyclic instant of time  $Tp$  in seconds. The intensity in terms of a change in relative volume during a second would give the constant rate of change of volumetric stress in space, within the same time period, as  $G$  Sankhya or  $G_s$ :

$$G_s = St / C^3 = \left[ \frac{(C^x)^2}{k^3} \right] = 1.482879E + 10 \quad [1.42]$$

The proof for  $G_s$  is confirmed by breaking the coherent volumetric state into its equivalent resonant state as minimal area times maximum acceleration into  $G_s$  must equal the maximum coherent stress density as mass:

$$G_s = Mps / \left[ Lp^2 \times 7 / Mly \right] = 1.482879E + 10 \quad [1.43]$$

There are three more modes of proof for the constant  $G_s$ :

$$Mps / Tp \left[ C^3 \right] = Mps / Lp \left[ C^2 \right] = \left[ Mps \times Tp^2 \right] / Lp^3 = Dp \times Tp^2 = G_s \quad [1.44]$$

From the foregoing, the structure of each component in space can be expressed in terms of a real object, where  $D$ =maximum density,  $T$ =minimum time,  $M$ =maximum unit mass,  $V$ =the limiting volume and  $Lp$ = the smallest length of a rigid object.

$$(Area \times acceleration \times flux \times D) = (V \times (flux \times D / T^2)) = (V \times mass \times D) = M \quad [1.45]$$

$$Lp^2 \times Lp / Tp^2 \times G_s = Lp^3 \times G_s / Tp^2 = Lp^3 \times Dp = Mps \quad [1.46]$$

Hence the relative dimensional attributes of each component in space is  $Lp^3$  as volume,  $Dp$  as density and  $Mps$  as mass and the process of derivation has established the parameters to be the limit in each of its type relative to the axiomatic value of  $C$ .

$G_s$ , the surface area flux stress intensity that separates the simultaneous or compressive or continuum state of the components in space from its sequential or expansive or quantised characteristics forms a universal constant. Value of  $G_s$  provides the dividing parameter between the coherent volume and resonant volume or when exactly the solid surface characteristics alter into a fluid state. The stresses in the three axial directions are in phase so that the components act as a single, rigid, dense mass but breaks coherence to attain the resonant and expansive phase at stress intensity rate of change less than  $G_s$ . The interval of time between interactions is minimal as  $1/G_sFc = G$ , which forms the Newtonian gravitational constant in Physics:

$$G = 1 / G_sFc = 6.6712819E - 11 \quad [1.47]$$

**It is evident from the above derivation that the Newtonian form of the gravitational constant is a consequence of the merged simultaneous interactive counts  $C^x$  squared in a compression cycle that increased the stress density to 2 ( $=k^3$ ) shown in equation [1.41]. It occurs in space that has a maximum stress intensity of  $St$  as in equation [1.40], which has been identified by both Sakharov and Chandrashekhar as the metric elasticity of space. Hence space cannot be treated as a void in a vacuous state.**

The real nature of  $G$  is an interval of cyclic time that separates the interactions before it merges into a continuum or combines the components in space into a rigid group by an inward acceleration because the interactive rate has reduced by combining. Further, the merging can take place only when the time interval reduces in each axial direction identically to attain a coherent state. The reason for the failure to see its true characteristics lies in not realising that dynamism is an inherent part of the cyclic time parameter. Plurality of elemental components must naturally lead to interactive states. Therefore components in space act as a rigid aggregate when its interactive interval of time, in seconds, is less than  $G$  or compressive stress intensity is more than  $G_s$ . It determines when the coherent state of mass with a centre of action is formed from the balanced resonant state.

The merging of  $Tp^2$  in a coherent state gives an addition proof that  $G_s$  is equal to the maximum interactive stress intensity as an accelerative flux in relation to  $Dp$  as the maximum volumetric stress density:

$$Dp [Tp]^2 = G_s \quad [1.48]$$

The proof for  $G_s$  can be strengthened by deriving both  $Dp$  and  $G_s$  through an alternative method. As shown before  $C$  transmigrates as  $C^x$  in the dense mode of a simultaneous state within the instant and its volumetric value as  $C^3$  hides a merged ratio of  $(C^x)^2$  during the period of volume or density change of 2 units. Therefore  $G_s$  should equal:

$$G_s = [C^x]^2 / 2 = 1.4829E + 10 \quad [1.49]$$

In the compressive mode  $C^x$  is increased  $C$  times per cyclic second as  $C^{1+x}$  and when the instant is increased to 2 the volumetric increase is  $8-1 = 7$  as a simultaneous interaction into  $k$  as the radial increase. Therefore the maximum stress density would be  $Dp$ :

$$Dp = \left[ [C^{1+x}] k \right]^7 = 4.596E + 96 \quad [1.50]$$

The fact that the maximal values of  $Dp$ ,  $Tp$  and  $G_s$  can be individually derived in separate ways without destroying its mutual proportionality is the acme of precision, self-similarity, scale-invariance and logical rigor, based on axioms. **Such conformity cannot be accidental.**

Unless the interactive counts are greater than  $Tc$  between two axial directions across a radial gap with a ratio of  $k-1$ , both would act as a single interactive surface. Therefore the ability to count, detect and measure interactive states is possible only after a cyclic interval equal to  $(Tc-1)$  times  $Tp$  in seconds. Converting it to a displacement ratio in which stresses would begin to transmigrate is  $[(k-1) C] m/s$ . Therefore the constant  $b$  as Planck's constant must be:

$$b = Tp \times [Tc - 1] \times [k - 1] \times C = 6.62619863 \times 10^{-34} \quad [1.51]$$

**The spectrum of simultaneous interactive stresses, from  $Mly$  to  $h$ , is hidden and undetectable from direct experimental observation because these interactive counts have merged to become a dense and coherent stress count volume as a single quantum that transmigrates from component to adjacent component in space  $Tq$ :**

$$Tq = b / Mly = 4.9278E + 17 \quad [1.52]$$

Therefore each accelerative quantum transfers  $Tq$  interactive stress counts simultaneously to the next component in space which is at the  $Ne$  state. Therefore the total reduction in the stress counts is  $(b-Ne)/Mly$  as  $Th$ :

$$Th = [b - Ne] / Mly = 4.2192E + 17 \quad [1.53]$$

The quantum  $h$  transmigrates from one quantum to the next in a volumetric resonant oscillatory ratio by expanding from 1 to 2 volumes, which gives a radial displacement ratio of  $k$ . Therefore the total transmigratory count is  $kTh$  as  $Hp$ :

$$Hp = kTh = 5.3158E + 17 \quad [1.54]$$

$Hp$  is the equivalent of the Hubble's expansion parameter which was interpreted as a redshift in the frequency of light received from distant stellar sources. The displacement of light at  $C$  frequency is  $Fc$  metres per interactive cycle per second which gives the transmigratory distance of  $Hp$  as  $FcHp$  and  $L_y = 3.26$  mega parsec as the distance Hubble's had used to obtain the ratio of expansion. Then  $Er$  as the expansion ratio is:

$$Er = L_y / FcHp = 3.084E + 22 / 5.373E + 17 = 57395m. \quad [1.55]$$

Therefore  $L_y/Er = FcHp$  is indeed the distance at which the entire potential of simultaneous stress counts of  $Th$  is expended over that distance after which the second harmonic

at 1/8 the stress density transmigrates over a similar distance  $H_p$ . The reduction in volumetric stress density increases the interval of separation between interactive counts which is reflected in the frequency spectrum of the light received from a distant stellar body. **In Sankhya theory space can never expand as it must absorb any interactive stress count rate higher than C.**

The Planck's constant  $h$  indicates that when resonance is broken by  $T_c$ , the distance that the interactive stresses in space would transmigrate across a resonant radial gap  $(k-1)$  to create the first volumetrically resonant harmonic. It is defined as the Compton wavelength in Physics and is a linear term, whereas it is indeed a volumetric displacement of cyclic interactive stress, as shown later on. The description of Planck's constant  $h$  in Physics as the quanta or photon indicates it is the first holographic quantum of stress that is accelerated to transmigrate across the gap created by the second sequential volumetric harmonic, which resonates in step with the primary volume. From this derivation the definition of mass and charge can be established as; when interactive stresses in space can be compressed it is a charge whereas when it acts as rigid continuum it is a mass. But the transition from charge to mass is not sudden but takes  $T_c$  interactive stress counts over a distance of  $k-1$  and volume change of 7, which has been equated to  $h$  in seconds. Therefore the quantum of stresses transmigrating over a relative distance  $k-1$  constitutes work or energy and a photon must decay over distance. Hence this transition spectrum of stresses as Ne, remain in the same or  $(k-1)$  location of the boundary as a resonant holographic quantum in a perpetual oscillatory state and is measured as the Compton wavelength. As long as the Ne oscillatory stresses do not transmigrate the oscillations continue. When 7 Ne are accelerated simultaneously across the  $k-1$  to equal  $h$  as the quanta or photon, the loss in sequential stress per quantum is  $L_q$  counts per cyclic second:

$$L_q = \frac{7Ne}{Mly} - \frac{h}{Mly} = C^2 \frac{k-1}{7} = \frac{k-1}{7} \left[ \frac{1}{Cc \times Ce} \right] = 3.275 E + 15 \quad [1.56]$$

$$L_q = \left[ \frac{h}{Mly} \left[ \frac{1}{T_c - 1} \right] \right] = 3.275 E + 15 \quad [1.57]$$

$L_q$ , the difference in coherent potential, is also equal to the variation in surface area flux density of the electromagnetic field and is shown above. It is also equal to the stress count that breaks coherence to initiate sequential transmigration. Count values above  $L_q$ , the resonant interactive stress count, stresses transmigrate with outward acceleration whereas from 1 to 6 Ne where the counts are less, the acceleration is inward that gets progressively larger. At  $7/Mly = Ah$ , the maximum accelerative count, it is evident that the resonant Ne state must be triggered instantly to 7Ne for a photon to radiate. Unless at least one Ne is motivated to transmigrate no stress transfer takes place and no work or energy functions. Ne, the resonant state, is the neutrino in Physics and does not transmigrate but any change in stress count in excess of Tr creates it at that location. In Physics  $L_q$  is equal to 13.6 volts. As  $Gm$  is the transfer constant from coherence to resonance,  $13.6/Gm = 1.89$  volts which is the work function value in the photoelectric effect.

$G_s$ , the Sankhyian interactive stress ratio that determines when a volumetric interaction is coherent or resonant. Recalling that inward acceleration is caused by reduced interactive counts due to merging, transmigration of stresses towards the centre increases compressive stresses around the components in space and maximises when the interactive count difference between each axial direction becomes less than  $T_c$ . The reverse outward transmigration commences when the counts between two axes become more than  $T_c$ . Within the transition period of  $T_c$ , a resonant state prevails.

The foregoing derivation establishes the nature of interactive states of the components, comprising space, in the simultaneous and resonant modes. The combining of 8 components into a

simultaneous state, through the Abs inward accelerative stress as gravitation, led to the derivation of the 7 incremental volumetric states of Mp. At the same time the stress intensity or interactive count density at the resonant boundary would change to a lower level as ratio P<sub>x</sub>:

$$P_x = \left[ \frac{1}{2} \sqrt{\left[ \frac{10}{\pi} \right]^2 + \left[ \frac{10}{\pi} \right]^2 + \left[ \frac{10}{\pi} \right]^2} \right]^3 = 20.94799 \quad [1.58]$$

The change, compared to K<sub>x</sub>, as a ratio P:

$$P = K_x / P_x = 0.04367904 \quad [1.59]$$

The factor  $10/\pi$  denotes the interactive transition from the coherent state to the resonant state in each axial direction. Extending it to the domain of experimental Physics, with the value of time in seconds, (in volumetric form,) PM in kgs as  $m^3/s^3$  and the same dimensional process can be continued though the values are derived as dimensionless interactive count ratios.

$$PM = P / C^3 = 1.67442 \times 10^{-27} \quad [1.60]$$

PM is the transitional state of the coherent core Mps state into a resonant particulate state and forms the resonant nucleus in Physics. It is an undetectable resonance at the surface boundary of the 8 combined components of space. Analysing the entire spectrum of transition from the coherent Mp to the resonant P and Mps to PM, the compressive and expansive interactive stresses remains in total balance, confined within the same location. It therefore provides a dynamic potential head that would radiate the stresses in a sequential transmigratory mode when the difference in the interactive interval exceeds T<sub>c</sub>. Therefore the ratio of compressive to expansive stresses in the simultaneous and resonant states can be derived as Mp/P or Mps/PM in terms of the second in Physics:

$$(Mp)(P_x) = 149.62847 \quad [1.61]$$

$$Mps / PM = 1.316 E + 19 \quad [1.62]$$

$$\left[ \frac{Mps}{PM} \right] \left[ \frac{P}{Mp} \right] = C^2 = \left[ \frac{1}{\epsilon \mu} \right] = 8.796 E + 16 \quad [1.63]$$

$$\frac{Mps}{PM \times P_x} = C^2 Gm = \left[ \frac{2\pi}{10} \right] 10^{18} \quad [1.64]$$

The above transition marks the ratio of change from a resonant to a coherent state and is extremely significant. Firstly, Mp/P is less than T<sub>c</sub> thereby ensuring that the coherent state will never be broken spontaneously to attain a resonant state. Secondly the transition from the resonant sequential to the simultaneous coherent states has a merged ratio C<sup>2</sup>, signifying that the charge to mass and vice versa conversion is exactly the same as found experimentally. The source of the permittivity and permeability constants arises from changes in the Mps/PM domain, which has never been identified in Physics. Hence the erroneous idea had evolved that electric and magnetic fields were mutually induced and therefore it had the ability to propagate its force to infinite distances. Thirdly, there are 18 orders of interactions, each equal to  $2\pi/10$  of a cycle, merged into simultaneous state at high interactive stress density and conceptually it can be seen as winding numbers or cycles frozen together. It forms the potential well as stress counts merged into the simultaneous state that causes the tremendous inward acceleration as the source for gravitation.

The dynamic potential in the coherent state as merged simultaneous interactions provides the acceleration to radiate a quantum of stress as Ps:

$$P_s = \left[ \frac{Mps}{PM} \right] \left[ \frac{1}{P_x} \right] = 6.2827 E + 17 \quad [1.65]$$

The ratio of dynamic potential Ps and the intensity of stress in space St is a perpetual state as:



$$R_s = \left[ \frac{P_s^2}{S_t} \right] = 1.02040816 \quad [1.66]$$

The sequential interactive counts required to accelerate a stress quantum is Ks:

$$K_s = b / Mly = 4.9278E + 17 \quad [1.67]$$

The difference as a ratio of Ps/Ks is Pp:

$$P_p = \frac{P_s}{K_s} = 1.27495 = \left[ \frac{7}{2\pi} \right]^2 R_s \left[ 1 + \frac{1}{T_i - 1} \right] \quad [1.68]$$

The simultaneous to sequential transition ratio Pp is larger than the needed displacement ratio k in order to provide the coherent symmetry breaking constants shown on the right. Reiterating, the nucleus, comprising 8 components bound by gravitational acceleration Ab, is a simultaneously interacting combination of a coherent and resonant interactive oscillations, compressive at the core as Mps and expansive at the boundary surface as PM, providing the potential to sustain a perpetual harmonic oscillatory state and initiates the transmigration of stresses when its harmonic balance is upset.

While the compressed Mps had the Lp<sup>3</sup> forming Vp with extremely high density interactive stresses PM as the expansive state, has a relative volumetric state Vm created by Rp:

$$R_p = [k - 1] / C^{1+x} = 5.089E - 15 \dots V_m = R_p^3 = 1.318E - 43 \quad [1.69]$$

The resonant state commences by expanding to twice the volume and k-1 is the incremental displacement. Along with it the constant C increases by C<sup>x</sup> to occupy the incremental displacement gap. The Mps stress density Dp reduces to PM/Vm as Pd:

$$P_d = PM / R_p^3 = 1.27E + 16 = \left[ \frac{C^x}{k-1} \right]^3 \left[ \frac{K_x}{P_x} \right] \quad [1.70]$$

The gravitational acceleration at the boundary surface reduces to a very small value Pg:

$$P_g = \left[ \frac{PM}{R_p^2 G_s} \right] = 4.36E - 9 \quad [1.71]$$

Because the inward acceleration is very low as Pg, the outward stress transmigration can be initiated easily. The period of cyclic time (second) is Pt:

$$P_t = \sqrt{R_p / P_g} = \sqrt{G_s / P_d} = 1.08038E - 3 \quad [1.72]$$

Also the Permittivity and Permeability parameters are directly connected to Rp as the radial distance of the coherent surface of PM. Hence the mode of derivation of the two parameters in Physics is an approximation as the existence of the Pho state had not been established.

In Sankhya time is not a separate parameter for it only indicates the interactive interval in an axiomatically dynamic oscillatory state. Therefore, as Mly was derived on the bases of an accelerative transmigration from all six sides of a volumetric state, then Pt<sup>6</sup> × Ps = 1:

$$P_t^6 \times P_s = (1.59E - 18) \times (6.283E + 17) = 1 \quad [1.73]$$

Two important principles are covered in this equivalence. Volumetric change in interactions in the simultaneous state is equal to the change in the cyclic interval thereby proving that no stresses are unaccounted for. Or that the algebraic sum of the exchange of compressive and expansive stresses are zero. Since measurable time is not involved no work or energy is lost in resonant decay, hence the entire oscillatory process can continue perpetually. Therefore the complex nuclear state will decay in infinite cycles or time. Its proof is provided by the constant of resonant decay in infinite cycles Rs:

$$M_p s / [(PM)(P_x)(C^2)(7)] = R_s = 1.02040817 \quad [1.74]$$

Beyond the PM boundary the resonant state can change to an outward accelerative stress transmigratory transfer when the resonant symmetry is broken. Gm is the constant that

transforms the coherent state to a resonant one. The incremental displacement ratio  $k-1$  and the seven incremental volumes during the expansive phase form a ratio  $Ke = (k-1)/7$  in each axial direction and in all three it is  $Ke^3$  and the ratio of increase is  $Ke^2$ . The increase in volumetric ratio when expanding resonantly is 2 or  $k^3$ . When PM expands the stress density must reduce to  $Pm$ :

$$Pm = \frac{PM}{Gm} \frac{2+Gm}{[1+Ke^2]^2} = 1.67262151E - 27 \quad [1.75]$$

When PM expands it reduces to  $Pm$  and on the compressive cycle it increases to  $Pn$ :

$$Pn = \frac{PM}{Gm} \frac{2+Gm}{[1+Ke^2]^2} [1 + Ke^2] = 1.67492765E - 27 \quad [1.76]$$

$Pn$  is the Neutron mass and  $Pm$  is the Proton mass in  $kg$ s while PM is not yet recorded in Physics. PM is a pivotal coherent state in substantial space. The proof that  $Pn$ , PM and  $Pm$  are in a perpetual harmonic oscillatory state is given below:

$$\left[ \frac{PM-Pm}{Pn-PM} \right] \left[ \frac{2}{Gm} \right] = 1..(and) \cdot \left[ \frac{PM-Pm}{Pn-PM} \right] \left[ \frac{2}{7} \right] = Rs = 1.02040817 \quad [1.77]$$

The above proof shows that compression and expansion stress exchange takes place perpetually within the same cyclic time and the average value is  $Gm/2$  as  $Gmr$ :

$$Gmr = Gm / 2 = 3.57142857 \quad [1.78]$$

$Gmr$  is the dimensionless nuclear gyromagnetic ratio in a free field of space. The difference between  $Gm/2$  and  $7/2 = 1/14$  and confirms the perpetual status as  $7-(-7) = 14$ , as a precisely balanced interactive state. Both  $Mps$  and PM are factored by  $Gm$ , proving again that the coherent and resonant states exchange coherent mass in the  $Gm$  cycle whereas the  $Pn$  &  $Pm$  states exchange coherent charge as mass. The exchange of compressive and expansive stress within the nuclear boundary is a change in the stress density as a potential. The similar exchange at the 2<sup>nd</sup> harmonic boundary accelerates stresses to transmigrate to the adjacent component in space. The symmetry breaking parameter  $Tc$  and the impedance to stress transmigration  $Si/Rs$  form a ratio as  $Si/(Tc Rs)$  and the stress count intensity of PM is reduced at its harmonic boundary as  $Mep$  as  $kg$ s:

$$Mep = PM [Ke]^2 \left( \frac{k-1}{100} \right) (Tc) = 9.114E - 31 \quad [1.79]$$

Simplifying  $PM/Mep$  can be written as:

$$\left[ \frac{7}{k-1} \right]^2 \left[ \frac{10}{2\pi} \right]^2 = 1837.187315 \quad [1.80]$$

$Mep$  is the compressive flux stress density at the 2<sup>nd</sup> harmonic surface boundary oscillating as a single spherical envelope around PM, at the resonant rate of  $C$  but with a volumetric displacement of twice that of  $Vm$ . The  $Mps$  density of  $Dp$  was derived using  $(C^{1+\infty} k)^7$  as the compressive state. Similarly the expansive state is  $C^{1-\infty}$  and its sequentially interactive and merged density is  $Dm$ :

$$Dm = [C^{1-\infty}]^7 \quad [1.81]$$

$$Me = \left[ \frac{Dm}{Ab} \right] \left[ 1 - \frac{2}{\sqrt{5}} \right] = 9.11023E - 31 \quad [1.82]$$

$Mep$  is the resonant stress flux density value when the PM boundary compresses.  $Me$  is the merged stress flux density when  $Mps$  expanded. Therefore, PM in the  $Pbo$  state has a  $Gmr$  ratio that would resonate with its boundary if the oscillations are to continue perpetually. Therefore the difference in compressive stress density between  $Mep$  and  $Me$  must enable the derivation of the expanded density state as  $Mee$  or the Electron in Physics. But the 2<sup>nd</sup> harmonic boundary has a displacement ratio of  $k$  that would modify the  $Gmr$  proportionately.

$$Mee = Me - \left[ \frac{Mep - Me}{kGmr} \right] = 9.10938382E - 31 \quad [1.83]$$

*Mee is the Electron stress density and matches experimental findings precisely. The proof is shown below:*

$$\left[ \frac{PM - Pm}{Pn - PM} \right] = Gmr = 3.57142857 = \left[ \frac{Mep - Me}{(Me - Mee)k} \right] \quad [1.84]$$

*Gmr is the ratio of the finest level of difference between compressive and expansive oscillatory states and has a value of GmrC oscillations per second as Ls:*

$$Ls = GmrC = 1.0591998E + 9 \dots \text{cycles / sec} \quad [1.85]$$

*Ls is the increased rate needed to create the Gmr ratio from the normal Pbo rate.*

***It is an extraordinary state of dynamic balance but is made to seem sterile mathematically. The left side of the Gmr equation is in the simultaneously interactive state C, at a much higher stress density level and the compressive and expansive stresses exchange counts too are at the same rate Gmr. Whereas the right side is in the sequentially resonant state C, but at a much lower stress flux density level, at a displacement ratio k and rate of Gmr. Change in sequential time at the Mee or Electron level as charge is converted to a simultaneous potential level as mass at the Pm or Proton level, within the same period. The mechanism of converting both the simultaneous counts as potential and the sequential count as a time interval is by varying the stress count rate change both additively and logarithmically at the same time. It is a tunnelling process where density is increased by converting the count to its logarithmic value or by creating the simultaneous state through incremental stress counts that breaks resonance. The***

*The ratio of two sequentially interacting components will have a cyclic ratio difference as*

$$\left[ 1 - \left[ 1 / \sqrt{1 + 2^2} \right] \right] = 0.5527864 \quad [1.86]$$

*In the simultaneous interaction the logarithmic increase of C will be Lsq:*

$$Lsq = \text{Log}(C) + .5527864 = 9.02492235 \dots (and) 10^{9.02492235} = 1.05906436E + 9 \quad [1.87]$$

*The logarithmic value Lsq is less than Ls because the perpetual resonance factor Rs has been changed by the increase in count rate consequent to decrease in the Pp ratio of change from simultaneous to sequential states. The compressive stress count as Cx / Pp = 1.35076825E+5, is the ratio needed to break resonance but the cyclic time in which this interaction occurs must be reduced from Pp. The ratio of radius to circumference is 2π and 1/(2π)<sup>3</sup> is the coherent or simultaneous time value for a coherent cycle. Therefore:*

$$Cx / \left[ Pp - (1 / 2\pi)^3 \right] = 1.35505304E + 5 \quad [1.88]$$

*Correcting Ls:*

$$\left[ Lsq - 1.35505304E + 5 \right] = [1.05906438E + 9] \left[ \frac{2}{7c} \right] = 1.02027762 \quad [1.89]$$

*The value above is less than Rs=1.02040817 providing the proof that the simultaneous potential stress count has reduced through a logarithmic factor to provide the increase in the sequential count at the expense of a change in Rs.*

*Ls is the Lambshift, found experimentally in Physics and it gives proof of the continual exchange of stress quanta as photons that keeps the Pm as Proton and Mee as Electron in a dynamic state. Here again Mep, Me and Mee exchange sequentially resonant charges, ready to transmigrate. However, as stated earlier, the Mee or the Electron has an*

interactive displacement of  $k$ , which would affect experimental measurement by a proportionate impedance factor  $Si$  as follows:

$$\left[1 / \left(1 + \frac{1}{k-1}\right)100\right] + 1 = 1.002063. (\text{and}) L_s / 1.002063 = 1.05701926 E + 9 \quad [1.90]$$

The measured value of 1057 Mcs is a convincing proof for Sankhyan theory as it is an axiomatic derivation in which there are no uncertainties, hence all the interactive stress count values are shown precisely and unambiguously. Further proof is provided by precise matching of ratios of important parameters for which there is no theoretical reason in Physics but as shown the Sankhyan axiomatic derivation leaves no room for doubt.

The Proton to Electron mass ratio as a dimensionless number is an enigma in Physics. The Pbo state derivation demonstrated the equivalence of the Electron as the boundary state of the Proton, both of which oscillated at the same rate  $C$ .

$$\left[\frac{P_n}{P_m}\right] = 1.00137875 = 1 + \left[\frac{k-1}{7}\right]^2 \quad [1.91]$$

$$\left[\frac{PM}{Mep}\right] = 1837.18731507 = \left[\frac{7}{k-1}\right]^2 \left[\frac{10}{2\pi}\right]^2 \quad [1.92]$$

$$\frac{P_n}{Me} = 1838.512267 \dots \frac{P_n}{Mee} = 1838.6838 \dots \frac{P_m}{Mee} = 1836.1522 \quad [1.93]$$

$$\left[\frac{P_m}{Mee}\right] \left[\frac{1}{\beta}\right] = 1.00000025846445 \quad [1.94]$$

The  $P_m/Mee$  ratio 1836.15219687196, as the Proton to Electron mass ratio, referred to as  $\mu$  or  $\beta$  in Physics, is recorded as 1836.1526724718. It is slightly larger because the hidden  $PM/Mep$  ratio that forms the reference base which is not yet discovered in science has coloured the experimental measurement. The proof given here discloses the real nature of the  $P_m/Mee$  ratio which has been derived axiomatically and confirms its correctness compared to the measured value

$$\left[\frac{7}{k-1}\right]^2 \left[\frac{10}{2\pi}\right]^2 \left[\frac{1}{\beta}\right] = 1.00056348397 \approx \frac{PM}{Mep} \frac{Mee}{P_m} = 1.000563743 \quad [1.95]$$

The comparison of  $\beta$  with  $PM/Mep$  and the same with  $P_m/Mee$  as the actual value of the Proton and Electron in a resonant state of balance shows a small difference. Any experimental measurement interferes with the resonant state and hence both the Proton and Electron have a different measured value from that shown in Sankhya. It must be reiterated strongly that axiomatic derivations cannot be changed and therefore form a benchmark, as it has been proved by the foregoing.

All the ratios match precisely, considering that the axiomatically derived values cannot be changed but experimental measurement errors need tolerance levels. Since all the states relate to stress levels on the components in space, the accelerative environment on the earth would induce errors in measurement too. Reiterating, the derivation of the Pbo state and all its concomitant ratios based on axiomatic fundamentals, at the most important core level of Physics, have never been carried out nor attempted. However, the precise equivalence of experimental findings provides unequivocal confirmation for Sankhyan logic that all phenomena can be derived by the process of counting interactions combinatorially. The single variable needed to balance phenomena is cyclic time.

The derivation of the Mps, PM, Pn, Pm, Mep, Me, Ne and Mly states from fundamentals are possible because the relative time-interval remains constant in a coherent and resonant environment comprising the components in space. However the Mee or Electron is the balancing outer surface boundary of Pm or Proton and therefore neither its relative oscillatory interval nor the boundary displacement ratio is ever constant. Since the process of balancing involves changes in the transmigration rates and flux density, the Mee state mass value is only correct at the instant of balance in sustaining the Pbo state. Hence it is the only parameter that

cannot be derived independently but it has to be equated to an axiomatic constant of balance. Because of its changing characteristics it is the only state that can be directly detected by counting.

The  $P_{ho}$  stress is compressive at  $M_{ep}$ , resonant at  $M_e$ , attains coherence at  $M_{ps}$  and expansive at the second harmonic level of  $M_{ee}$ , at a radial displacement ratio  $k$  forming the boundary of  $PM$ . Similarly the higher density stress is compressive at  $P_n$ , resonant at  $PM$ , attains coherence at  $M_{ps}$  and expands at  $P_m$ . All oscillate at the resonant  $P_{ho}$  rate of  $C$ , at twice the volumetric displacement  $V_m$ . While the interaction between adjacent components is sustained at an axiomatic rate of  $C$ , any accelerative change increases the count rate by a logarithmically proportionate decrease in the potential ratio  $P_p$ . Therefore the harmonic state of the continuum in space is kept in dynamic balance perpetually. If and when any interactive rate goes below  $C$ , it is absorbed and the local potential rises through logarithmic conversion. The interactive control mode is based on modulating stress count densities through logarithmic variation of count rate of the standard  $C$ . All the other coherent states mentioned above cannot be counted directly but can be inferred through the state of the  $M_{ee}$  electron state due to changes in stress count density and interactive intensity. However all the stable particulate states can be calculated precisely because of the single self-similar and scale-invariant Guna law of interactions, shown earlier.