

# Topical: Quantum Equivalence Critical Radii and Anthropic Extreme-Interstellar Objects Rare Events Coupling

**Thematic Areas:**  The effects of the spaceflight environment on biological and biophysical systems and processes  The effects of the spaceflight environment, including gravitational effects, on physical systems and processes  Gravitational and other space environment effects on physical and biological processes involved in the functioning of space exploration technologies  Other: Space test of Quantum and Relativity Principles

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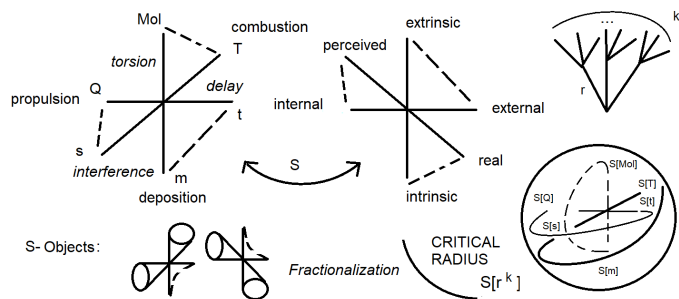
**Abstract:** An Object Oriented Language for granular quantum equivalence infraction permits to introduce resonances between homologous pulse quotients of physical cycles, astrobiological evolutions and orbits. I suggest the science challenge of Fundamental Physics in microgravity and e.m. control for characterizing Space ranges of such exploration. By it, starting from the platform of Space Station for the biological side of extreme events, I hint a connection with Anomalous Interstellar Objects rare events.

# 1 Test of Quantum Equivalence in Space and Critical Radii of String Tension

A semantic direct approach in Information Theory can account for the fact that torsion pendulum, dynamometer and determinantal point process counter have the content of a phase factor which passes to wave frequency of detector. A similar approach happens in the all-encompassing progress in Cosmology that demands to couple Science of Life at homotope objects to explain evolution of Life respect to Cosmic Era. I propose to introduce a unifying approach extending the equivalence of Bekenstein between Physics and Information Theory (see [1]) in an Object Oriented Language of Building Blocks (or Black Boxes, BB) for BH-CMB and Life Coupling. I assume that such a Language (or S-Language, S) be self-referential under maps of Pulses between Objects. Respect to this,  $S$  would be a formal language with a partition in its logic signature which can interpolate a back-projection of Euclidean scalar product into syntactic equivalent expressions (of sum of components and angular evaluation) extracting Exceptions under suitable notions of cycles. Indeed, it would interpolate Natural Language propositions in classes of verbs (effective, elective and copulative) for minimal meaningful verbal syntagma of not composite BB.

**1.1** Starting from the sectors (BH Horizon, Matter), (Matter, Complex Systems) in the coupled languages (Symbolic Dynamics, 0-1 Random Signals), (Dynamical Systems, Percolation Measure) and (Topological Dynamics, FK Measure) the strategy is to look for a Loose formalism with a mechanism of stability to bypass landscape paradox in a not dismissive way. In a broad sense, it would let place for the new mathematical tool that the S-declaration of cognitive mechanism underlying categorical formalism and propositional logic induces an S-drift under a pulse conservation in a triangular graph. This happens in the sling pulse of giving back Information Theory from Topos Algebraic Geometry and giving back Wave Quantization from Propositional Attitudes Logic as the S-Language homotope of Inflation Theory. There, I assume that quantum equivalence tests could be transferred from elementary settings of Cavendish Pendulum, Ballistic Dynamometer, Point Process Free Fall at various gravity and e.m. radiation stages of heat transfer. The measurements could pass from interferometers for  $t, s$  and Mol under equivalent formulations of space delay (from  $T$  to  $s$ ) such as scintillators ( $t$  from  $Q$ ) or counters ( $m$  from Mol). S-Language would just make a reversion between continuum and discrete setting of limit interacting systems, that is it would express transition just in the domination of Integer-Valued Gaussian Field respect to Gaussian Free Field. So, probabilistic methods would define a critical transition that corresponds to critical Radii in this setting (see [2])

**1.2** In a Kahler Manifold  $(\mathcal{M}, J)$  corresponding to that discrete deformation expressed in BV-model from  $S$ , involution operators are found at the limit point of every exception extraction as follows. Taking as relevant that  $Spin(3)$  is semantically equivalent to  $SU(2)$ , it is possible to define  $U(1)$  respect to exception extractions  $(E, \pm SD)$  under suitable cycles that are defined sketching the Spinorial structure in the ordinary  $J$  eigenvectors sum



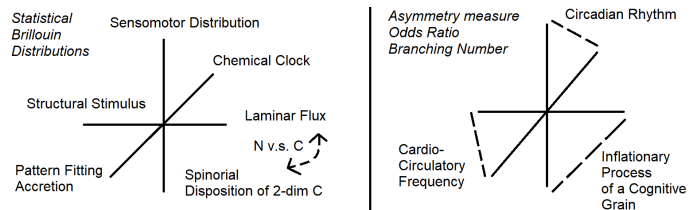
$\frac{1}{2}(1 \mp iJ) = v(s) \mp (1 - v(s))U(s) = E_{\pm}(U(s))$  which I interpret stochastically taking these operators just as 1/2 spins which are obtained in the expected limit of exception extractions as  $U^s \rightarrow e^{i2/2\pi} = -1$  if  $s$  parametrizes the stochastic growth. So Spin corresponds to the whole realizing of delay in case root of unity is taken for the haploid particle with  $U^s = U_{VAR_s} = e^{i2\pi(\frac{r^s v(s)+1-v(s)}{r^s})}$  with an exponent going to 1. This means that respect to the BV-measures it could be defined for not constrained, not equilibrium and not integrable dynamical systems implied by Kahler structure. Applying [3] and [4], by periodicity of root of unity, the exponent can be written as  $t - x$  as the minimization log-likelihood term  $f(x|\lambda) = s \log(\lambda) - n\lambda$  (with  $n$  observations whose sum is  $s$ ) of I.O. truncated Poisson distribution as I.O. are not integrable systems respect to some feature (all documentation in [5]). So, a truncated distribution deforms root orbit and can be written as propositional expectation of likelihood. From the other side, by consistency, it must be equivalent to a Sheaf Kahler structure with  $r$  global sections or a scheme of  $r - 1$  global sections covering or a Topos with  $r \rightarrow \infty$  local sections. Physically, not equilibrium would correspond to a particle at the final stage of interaction using, by spin composition (Fermion to Boson), supersimmetry. Whilst, quaternions could introduce the unlocking solution of dissolving into composition. This setting states that variance pulse saturation corresponds to supersimmetry which is postponed once the mechanism of space dimensions reduction is put in correspondence to cognitive expectations. All this can be iterated under equivalence between  $S^3$  and  $Sp(1)$ , and saturate in Scheme and Sheaf equivalent expressions for Topos build from BV-model. So, supersimmetry is conserved in pulse from  $SU(2) \times SU(2)$  of Lorentz Transform to Poincare group (adding translations in log-likelihood full term) as much as Pauli operators ( $SU(2)$ ) extend to Gellmann operators ( $SU(3)$ ). But now the following coupling is defined: pulse-sheaf corresponds to pulse-orbital locking. This has an immediate interpretation: the rare events in orbits of I.O. correspond to extreme anthropic events of whole body dissolution. This can be amplified retroprojecting supersimmetry which admits just the homotopes of weak decay entropy back-fluctuations towards mass and knotting of central charge which would be amplified in a 6 poles-saturated M-theory. This would admit phenomenology as unbalance would refer to one block whose symmetries saturate towards mass-energy missing amount (WIMPS, WISPS,  $\Lambda$ ) the other towards angular unbalance potentially in weak anomalies ( $\nu$ -mixing, B-meson decay,  $\mu$ -anomaly) **1.3** Granularity of complex systems uses collapse for passing from 3 to 4 dimensions in the homotopes (Cardio-Circulatory System, Coordination Complex in Heterocyclic Globuline), (Metabolic Process, Meiosis), (Mitosis, Hedgehog Signaling Integration into Intraflagellar Transport). Starting form the same setting in BH-Horizon, this scheme lets glimpse that heterocycles enter by the analogue of cardinality collapse in oxidation numbers and captures elements from astrobiological global origins as Coordination Complexes or Signaling Integration Systems. Category theory and its logic pulses homotope, after coming back to information theory, enters again as a pulse in S-language. Now self-referentiality is sufficient to express heat propagation into pulse quotient making something peculiar take place. Heterocyclic structures have initial symmetries which become the symmetries of regular analytic entities of the corresponding variety  $\mathfrak{M}$ . At this stage, heat singularity is able to localize into a condensate which grows up to pulse quotient when counting is made by its Picard group  $\rho$  as  $20 - \rho$  dimensions. It is attempting to identify this number with basic coding number under a geometric understanding of DNA degeneration having the homologous in blood-group symmetry and IFT dynein arms disposition. Indeed, expressing divisors as Chemical syntaxis of reactions, simple

interpretation is given to null Kodaira dimension for  $K3$  variety in the induced Picard scheme. **1.4** Reverting sectors, SG Free Energy enters into early metabolisms by cardinality collapse. This means that out of oxidation complexes or processes can be involved, and potentially be coupled as inflationary processes. The main case (see [6]) is IFT equation proposed by Marshall and Rosenbaum (in the simplest form  $dL/dt \propto \frac{a}{L} - b$ ) that assumes dependence from assembly and independence from disassembly of IFT Trains even if not completely understood. Limited to a BB of cognitive expectation it appears of tautological characterization, as it describes a process determined by pH shocks (using SG coordinates  $pH/Obstruction = \log(1/r)/\log(p_c^2)$ ) intrinsically ruled by cardinality collapse. So, BB can be extended in a whole cycle. Here, the main idea is coupling 2-dimensional Carbons and stratified Nitrogen flux. As much as I interpolate from SG pulse it could glimpse the common frequency of Carbon both in not Living and Living matter as well as liquid fluxes. But the conservative understanding of I.O. is centered on Nitrogen origin. Yet, the statistical equivalence of physical entities risk to express the persistent antagonism to Galileo Science which goes towards phenomena. Instead, the very interpolation of SG into the pulse geometry of measures (asymmetry, cross ratio and branching ratio) has a cognitive granularity that permits to project anomalous I.O. meaningfully in a Tautological Object. In particular, logistic regression can support the phenomenon of Remote Sensing as it measures a variance from Fermi exclusion condition of repeated state. Error, as a variance, once on orthogonal pulses can be included as a tautology. As an example, I can suppose that some not Earth life would be coupled to Earth one, as symbiotic species whose technology is limited to atmospheric impact. So seeing a rare object in impact could be stated as a true statement of Technosignature under similar confidence in orthogonal characters.

## 2 Coupling in physical cycles, astrobiological evolutions and orbits and M-Theory Pulse Saturation

Here I extend the case of Anthropic Extreme-I.O. Rare Events coupling to the most extensive cycle. I note that it reformulates the expected stochastic correspondence of relativistic lensing, time contraction and zero-point mass measure just cognitively. Natural language  $S$ -interpolation points to the tension of voluntary regeneration of living and conscious redefinition of existence.

**2.1** In more complex networks exceptions extraction guarantees semantic stability in integer and continuous parameters as it catches exceptions as a Postulate for the pattern (Definition, Proposition). Here, mass action law with varying elements is just a Postulate as it is possible to take the



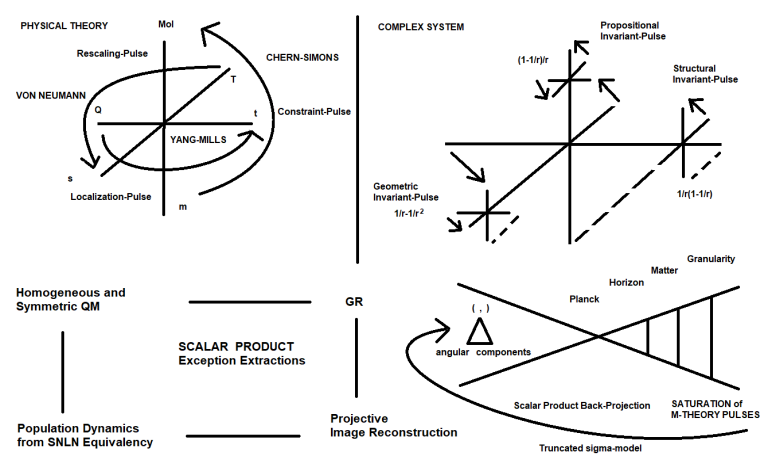
sentence that *the system has unique stationary points for the total amount  $\sum_i x_i = X$  if and only if the set of points  $\{x^* | f(x^*) = 0\}$  has cardinality 1*. This definition can be accomplished by a proposition in S-Language that gives meaning to  $S[\text{Semantic Stability}] = \text{System Stability}$ . Let  $F$  be the functional associated to the preceding minimization problem. *If  $F$  is convex the definition is satisfied*. As the definition says something respect to the total amount of reactants but its semantic stability says to do everything in a symmetric way respect to it, it admits a Self-Referred

language which states if it is semantically stable. But the corresponding proposition has the S-language term of convexity which is the symmetry condition respect to linear increasing. This trivial proposition admits equal formulation respect to definition, so that it is possible to extract exceptions in  $S$ . This complex number -as a glimpse- is what makes the quotient in projective reconstruction from the tangent space  $V$  and goes around diagram of Language equivalences. So it makes the special linear group  $SL(V)$  over  $V$  pass to  $PSL(V) = SL(V)/SZ(V)$ , with  $SZ(V)$  the subgroup of scalar transformations with unit determinant. In fact,  $SZ$  is the center of  $SL$ , and corresponds to the group of  $n$ -th roots of unity with  $\dim(V) = n$ . Cognitively it means that error is expressed in the not invariance pulse of identifying infinitesimal with projective construction (that comes from the 3 pulses of projected, many visioned and complex object) **2.2** The following reasoning is just Pulse conservation noting that 3 material axis can be disposed in 72 ways, so that a physical dimension can be referred to such disposition and be stated equivalently as space dimension angular coordinates or algebraic generators numbers. Starting from 4 dimensions means to be in the opposite situation respect to a pulse quotient, that is when a pulse invariant is taken as a pulse quotient. But in the preceding framework this happens when the spinorial representation of central potential interaction is banned to include gravity as a friction which would equate gravity to e.m. So the inverse pulse of signal smoothing is e.m. emission. By pulse conservation, now feed-back needs to convert e.m. collapse into matter. As 2 dimensional gravity refers to unitary random matrix, once understood as Euclidean relativity of reference frames, the pulse quotient that is looked for is stating that a particle is equivalent to every other particle expressed in a self-referred language without accounting for acceleration of reference frame and clock which, instead, must be moved. Quantitatively, I start towards not banning pulse quotient but stating pulse invariance by cardinality collapse. So  $S$  admits a propagation of Propositions *A particle is invariant under Euclidean relativity i.e.  $S$  admits  $Part_1$  particles such as it  $\rightarrow$  It is part of a continuum with  $Part_1$  particles i.e. it is part of a filled body that, by invariance, corresponds to its cognitive measures.* Assuming that the body is characterized by  $m, Q, T$  it is possible to associate  $S(m), S(Q), S(T)$  and compute  $S(m) - m, S(Q) - Q, S(T) - T$ . Now, assume that the particle be at position  $s$  in an hypercube of volume  $V = 1$  and in the interval  $\Delta t$  with indetermination  $\Delta V(1 - \Delta t) = 1 - t, (\Delta V + \Delta t)\delta(t = 0, 1) = \delta(t = 0, 1)$ , then, if  $S(s) = x$  the difference  $t-x$  equals a mean expansion of FLRW kind up to periodic term in orbit root. This means that if expansion corresponds to the sector of matter, Horizon corresponds to a flat space and singularity makes the quotient of variance, that is the variance of  $S(s)$  particles which is again FLRW mean  $S(s)(1 - S(s))$  giving for each particle the metric  $\frac{1}{t-vt} dt^2 - dx^2$  singular in  $v = 1$ . Note that in Quantum Mechanics formalism invariants rotate in the proposed geometry of pulses and express the persistence of quantizations method that appear to be an interpolation of eventually unbiased cognition. So, I start from a central gravitational interaction and try to understand light blending as a classical effect by complexity. Noether theorem introduces symmetries of central motion as a minimization problem. Now to this problem I can associate the mechanism of (Definition 1, Theorem 1) so that a complex field is obtained in correspondence to rotation. This is Bohm-Aharonov effect as it associates to external symmetry the internal symmetry of Gauge and it corresponds to the singularity of obtaining a variance as a central potential. As singularity is back-projected it means that it is solved as an S-term. This mechanism is supposed to state the simple behavior of root of unity stochastic term into the singularity of a black hole as its simulacrum. **2.3** The basic Interferometric formula is  $\lambda = \frac{2d}{N}$  which requires a linear measure and an angle. So, under the preceding approach, I interpret these elements from a

backprojected scalar product giving 9 roots of 4 units in case of meiotic process. Yet, the  $d$  length can differ from  $\pi$  incorporating  $Re(e^{-ix})$  as a mitotic term and letting the corresponding spread in  $N$ . This corresponds to the cognitive setting of the counting of entities that evolve over time (so uncertain) and the measurement of space through bodily contact (so uncertain). So, it conserves expected Folding of Distribution and String Tension parameters of Horizon Phenomenology. Using scaling of branching Tree  $T$  such that, at level  $k$ ,  $r^k \rightarrow r^{\frac{k}{z}}$ ,  $p^k \rightarrow p^{\frac{k}{z}}$ , it is possible to pass to the continuum and check if covariant equations are satisfied using the chosen parameters of space and time. Once  $delta$  is identified in very mechanism of root orbit, a cut-off can be assumed a posteriori to maintain observable quantities finite, and show that if  $\gamma = 1/2$ , the phase factor (as a mean conditioned to the signal  $S_{W_k}$ )  $E(E(e^{i\Delta X_i \Delta t} | S_{W_k}))$  satisfies wave equations with  $m^2 \neq 0$ ,  $U \neq 0$  for  $r \geq 3$  so that with finite  $z > k$  and distortion  $\eta_k = \eta_{c,k}$ , the mass and potential terms in equations are  $U = 1$ ,  $m^2 = 3$ . This means that an unbiased detector can pass delta distribution in its activity, which is just the deformation of particle presence and would be expressed as deformation itself. I reformulate this setting as detector-measure pulse by unbiased activity. This just translates the passage from Schroedinger to Klein-Gordon pulse of explicit expression of delta pulse in space-time deformation, and then equivalently, renormalization. So, it saturates the pulse of resuming Feynman diagrams to positive process of detection **2.4** Instead, the pulse of bouncing induces the poles from 3 to 6 of an M-theory to make cognitive operations that couple back to the original  $\delta$  distribution from the transverse axis. So, basically, the same pulse is found in harmonic analysis of wave packets and in GR covariance in the semantic weight of the coordinate choice that can be ruled over a cycle with  $(E, \pm SD)$  in

$$Try[Block_{Try}]Catch(E)[[Block_{Try}]Catch(E)[Block_{Handle}]] - Try[Try[Block_{Try}]Catch(E)[Block_{Handle}]]Catch(E)[Block_{Handle}] = 1/r - 1/r^2 \text{ using } (E + SD^2 - (E^2 + (\pm iSD)(\mp iSD))) \text{ for the operations involved.}$$

This rotates in pulses so that it can be expressed as the equivalence of mass density and geometric field or equivalence principle between an inertial or gravitational accelerated mass. This is the main setting of a rigid quantum gravity violation, that is where Quantum to Gravity correspondence is between Spin statistics and covariance-controvariance as ruling superposition Principle. So, in the space of Theory a triangular diagram accomplishes both but under opposite sense of rotation from one pole of variance to the other.



This means that resonance time corresponds to the continuum collapse to  $v = \log(1/r)/\log(p_c^2)$  in  $(r^k v + 1 - v)/r^k$  which gives  $\Gamma(1/r^k)\Gamma(1/r^k)/\Gamma(p_c^{2k})$  as String amplitudes of the detector geometric factor which conserves the just pulses of biologic subdivision in the cognitive process of measure  $Var_{BB}(k) = \tan[i * k] \tan[-i * k] -$  Inverse Entropy( $k$ ). This will include Baryonic Acoustic Oscillation as the counterpart of meiotic-mitotic pulse quotient. Indeed, the second asymptotic pulse of deviation would be Supernovae if I look at symmetry in e.m. condensate emission and Fermionic oscillations.

## References

- [1] Informing Physics: Jacob Bekenstein and the Informational Turn in Theoretical Physics, I. Belfer, *Physics in Perspective* volume 16, 69–97, 2014.
- [2] A comparison of plane rotor and Ising models, M. Aizenman and B. Simon. *Phys. Lett. A*, 76(3): 281–282, 1980.
- [3] Was the Interstellar Object ‘Oumuamua a Nitrogen Iceberg? A. Loeb, *Scientific American*, March 2021.
- [4] Probabilistic models on trees with intragenerational interactions: statistical mechanics and applications, R.G., *Series UMI; Series 1, Vol. 1 (2008), n.2*, p. 283–286.
- [5] The Galileo Project, *Documetation of the Center for Astrophysics at Harvard & Smithsonian*.
- [6] Intraflagellar transport, J. Rosenbaum, *Current Biology, Magazine R125, Guide 2002*.