

# Conjectures on SpaceTime

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## Abstract

The aim of this contribution is to propose new conjectures on SpaceTime variables and their description through the concepts of network and coherent decoding (borrowed from Information Theory) and to offer a possible wider perspective on SpaceTime fabric and evolution. The model follows latest efforts to restore the importance of Time in Physics (as Smolin in [1]).

The critical step suggested is towards how we perceive SpaceTime dimensions: a 4D quantized expanding SpaceTime with 2 components for Information Space and 2 orthogonal *time-momentum components* is considered.

The *time-dimensions* are derived in the context of an *imaginary time* (following thermodynamic and Hawking interpretation of relativistic distance) and a coherent phase with an Absolute Time pulse (defined in the *entanglement* of qubits in a network and related to inertial mass, *persisting* information and Bohm *Quantum potential*).

The SpaceTime geometry and *momenta* proposed are described in terms of AdS/CFT correspondence and an entangled neural network of *memory links* in the *bulk*.

Developing the conjectures proposed, elementary forces and particles are described from the viewpoint of *information* and *coherent decoding* (within a *discrete time pulse frequency* context), Newton gravity is mathematically derived and a suggested correlation among the Dirac equation, Shannon wavelet decomposition, Entropy, the Quantum Potential and Gravity is proposed.

To illustrate possible wider similarities and consequences of the model, additional hypotheses on Black Holes *information* are presented, together with possible connections between *entangled information* and *Evolution*.

Further developments are still required.

A wider mathematical and physical analysis is suggested to evaluate the implications on energy production and to explore the links with Natural Evolution and efficiency.

A deeper philosophical understanding is expected.

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# Variables and Geometry

## Time, Memory and discreteness

Given a quantization of Energy levels, a commonly agreed *discreteness* of Space on a Planck scale and the *unnatural existence* of a Real continuum in the fabric of SpaceTime without possible infinities (as debated in [2]) or physical paradoxes (as described in [3]), assume Time is discrete as well on a *minimum tick*, as an *entangled event buffer at each k*.

The quantisation of Space and Time becomes evident also from the effective discreteness of a finite-bandwidth classical signal, as proved by Nyquist.

The concept of a discrete time, connected to information, entanglement and gravity, has long been discussed in latest theories. The common understanding points at Planck Time T, as the discrete smallest possible interval of time.

Experiments to measure the discreteness of time and its relationship with mass and a *phase shift* have also been proposed in [4].

Consider this minimum difference at each *tick* T similar to a  $\pi$  rotation, as to *see things from a different perspective* and as  $2\pi$  or  $2T=T_k$  were needed to *come back* to the original *point of view* in an *Absolute Time pulse*, that identifies a clock and an *Absolute beat of reference* for every entity in SpaceTime.

The *pulse* is connected, in empty space, to the entangled *ground state* of SpaceTime energy.

Imagine, in each point of a 3D perceived space, the *feeling* of the *flow* of Time as a *phase sync* with the *variation* of this pulse and the variation of *external information* flowing on the *imaginary surface* along each ideal volume at each  $T_k$ .

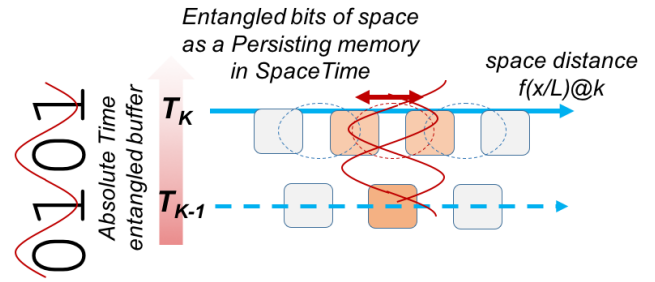
Towards a discrete axe of Absolute Time  $T_k$ , also mass should be relative to the scale of Planck Units and, as we will further discuss, it will be connected to local information accounted in the geometry variation of entanglement in SpaceTime fabric decoding.

In Planck Units, it is also easy to express fundamental constants. Giving  $L$ =Planck Length,  $M$ =Planck Mass,  $T$ =Planck Time and considering  $F=1/T$  as the ideal maximum degree of freedom in  $f$  (angular frequency or just frequency for short), it is possible to write the following:

$$\hbar = \frac{ML^2}{T} = ML^2F; \quad c = \frac{L}{T} = LF;$$

$$E_0 = \hbar F = \frac{\hbar}{T} = Mc^2 = ML^2F^2$$

Eventually, in a discrete Universe, even a *point* seems not of *Zero-size* nor *dimensionless*.



## Imaginary time and Information Space

Hawking proposed the concept of *imaginary time* as the *axe of a space distance* variable. Consider, in this context, *ict* as *imaginary time* (with  $c$  equal to the speed of light and being  $i$  the imaginary unit).

The concept of *distance* makes sense because of  $c$ , the speed of light: we could define distance in empty space as *the time needed for light to cover that distance* along the space-vector *ict*.

If the speed of light were not constant in *empty space*, there would be no *coherent distance*, hence no perception of a possible *coherent 3D Space*. In *ict*, for any space distance  $r$ , just *imagine coherence with time*, as eventually for *distances* we always consider the absolute value and *imagination vanish*.

The concept of an imaginary vector for Space suggests an orthogonal time on an ideal Real axis. From the proposed perspective, consider the index  $K$  of the Absolute Time (memory buffer depth from  $K=0$  to  $K=K_{NOW}$ ) as the Real axe of Time, accounting for the evolution of the Information Space.

From the concept of an *imaginary time*, as the imaginary distance  $ir$  between 2 points in space, we can construct an imaginary 3D Space considering, from any possible point as *origin*, the space described through  $ir$  and 2 Real degrees of freedom ( $\vartheta, \varphi$ ) in spherical coordinates. From the proposed perspective, 3D space is described as imaginary distances from the *barycenter* of each *entity* (particle) and seems perceived as the path-integral of momentum in phase-space of information points over 2 Real degrees of freedom and directions ( $\vartheta, \varphi$ ) along an *imaginary time*.

Consider the *imaginary time* flow over each surface at  $T_k$  connected to *thermodynamic entropy* and the *probability of moving* in 3D space.

Relativity Lorentz transformation on  $v_s$  (thanks to  $\gamma$ ) seems related to *ict* and *3D inflated space distortion* in relation to the orthogonality of Space vector and a coherent local ticking of Absolute Time.

The perceived local time *going to Zero* while travelling at  $c$  seems the imaginary perceived time along the direction of motion. In this context, space and time becomes *equivalent*.

The conservation of SpaceTime metric of 2 events (at relative space distance  $r$  and relative time distance  $t$ ) is connected to the conservation of *causality* in 3D Space and in the flow of Absolute Time.

The conservation of causality accounts for coherence also in the flow of Absolute Time, adding the contribution  $(ict)^2$  to consider the imaginary information propagation in space between 2 different non-entangled events in coherence with the memory of Absolute Time, defining a *4D coherent Now*.

The universal constant  $c$  could then be interpreted as not only the speed of light or causality, but also as the *Coherence* between steps in space (over the entropic *imaginary time ict*) and *beats* in time of our Universe (phased with the Absolute Time). It is the ratio between the push for *imaginary Entropy* and the Entanglement of the *current Now*.

If an entity travels at  $c$ , the imaginary time along that direction is compressed to *ideal zero* and the full Information-Space propagates as a thin *sail* of 0 rest-mass at the speed of light, carrying knowledge on frequency thanks to its pulse. It seems there is no *3D Space* as perceived, but a *2D Real Information Space* and *1D diffusive imaginary time* at each tick of Absolute Time.

3D space seems the result of the diffusive evolution of information bits path-integrated over the flow of an *imaginary time*, kept as a *coherent 3D entity* through entanglement in the *coherent Now* of the Absolute Time.

Our *3D Space* is our *coherent Now at each k*, defined by decoding the entropic 3D information within the  $2\pi$  of coherence of the local *Now* in the Absolute Time.

*Distance* is defined in the coherence of Space and Time. If there is entanglement between 2 entities, then coherence is not only in the propagation along the 3D inflated space in *ict*, but also through a *link of coherence* between the 2 entities in Absolute Time, as if *3D<sub>only</sub>-distance* had useless meaning, giving the coherent connection in the Absolute Time (entanglement).

The *delayed choice quantum eraser* experiment correlates events like in an *inverse time direction*, as long as the information is kept *undetermined* but still *connected*. Revealing on one side collapse the entangled wave functions in the Information Space.

It seems we live in a *coherent 4D Universe*, in which entangled information (propagating in 3D space) felt no *information distance*, keeping the coherence of our perceived 3D Space in the *dimension* of Absolute Time, as a common *beat* coming in a *legacy information* through *living memories*.

Coherent SpaceTime seems the result of the entanglement of each imaginary point with both the surroundings in the imaginary time (3D space) and the past and the future of the Absolute Time, assuring causality both in space and time in a *coherent 4D entangled fabric*.

### Perception of each *Self*

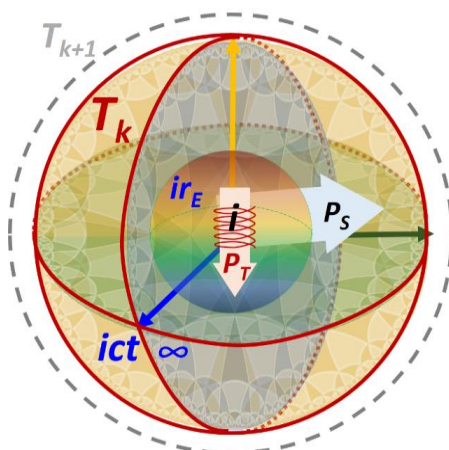
In our common description of Space, we focus on the *Self*, centering our understanding on the *i* and describing the Universe and each Entity in terms of relativistic distances. The picture is given as a differential over the imaginary time, and series of events integrated over a confusing passage of time.

We perceive SpaceTime along the imaginary time, in a *phase-space* of incremental needed *boosts of energy* to increase *velocity* and reach a horizon that blurs at infinity.

We focus on the *Noise*, forgetting our sync and the entanglement with the Absolute Time.

We lose coherence, confuse our *Self-beat* and distort the *code* for our *identity*.

Space and imaginary distances, made Real with 2 degrees of freedom  $(\vartheta, \phi)$ , become our description of *Reality* and Time dimension is left to short vanishing memory, limited understanding and far too often to uncorrelated analysis.



### Self perspective of *3D imaginary space*

#### @ $T_k$ NOW

- imaginary distance as local differential over *ict*
- coherent and relativistic phase-space along the momentum in Space
- centred on the imaginary *Self* and described integrating along the imaginary time and 2 Real degrees of freedom as  $(ict, \vartheta, \phi)$
- Infinitely far at the current horizon; finite at visible Universe horizon

## AdS/CFT and Neural networks

Instead of a relativistic description of SpaceTime centered on the imaginary Self, we can try to visualize the geometry and relation of Absolute Time and imaginary time following the correspondence of an Anti-deSitter (AdS) bulk space with a Conformal Field Theory (CFT) existing on the flat Minkowski space on the surface.

Consider a bulk *slice* @T<sub>k</sub> (of *height* 2T or equivalently  $2\pi$  in Absolute Time phase-space) and consistent of  $k$  *entangled qubits* of memory in a wavelet decomposition of the surface info along the *depth of the buffer*, equivalent to an AdS geometry as also proposed in the Exact Holographic Mapping (described in [5]).

The wavelet analysis exploits the scale invariances and the fractal self-similarities, allowing efficient representation of the information on the surface foam (usually log-normally distributed in natural phenomena, as highlighted by Kolmogorov in [6] and others in [7]).

In a parallel with Information Theory and traffic patterns, packets in telecommunication networks as well follows a lognormal distribution, due to a multiplicative character of the variables involved (as discussed in [8]).

The entanglement links are orthogonal to the surface (as Space and Time orthogonality) and follow the geodesics along the integrated hyperbolic bulk, developing in a log memory buffer along T<sub>k</sub>.

Given the Absolute Time as an *entangled memory buffer*, the AdS space can eventually be seen as well as a *deep neural entangled network* towards the core of the bulk, as proposed in [9]. The links connect, as entangled roots, the *surfaces bits of current Existence in ict* to the *inner nodes* of SpaceTime, propagating information in the *current AdS entangled memory-space* as optimal neural network to account for all the complexity of the surface quantum states (proposed in [10]). The differential information of the surface is optimally *stored and projected* as it follows the *geodesics* in the Absolute Time (as discussed in [11]). Further reasoning on complexity and quantum computation will be discussed in a following chapter.

The beat of the Absolute Time could also be related to the concept of *Quantum Potential* (described by Bohm in [12]). It is a delta at Planck scale locally coherent with the bounce of photons at current horizon of the CMB (in a Thermodynamic correlation with *ict* as proposed in [13]) and act as a reference for the *Information Potential*.

Absolute Time allows *non-locality* of 3D space (connecting distant surface bits along the imaginary time) and consequently, as a common pulsing root, the “*unbroken wholeness of the entire universe*” (Bohm, Hiley et.al. in [14]).

The connection between entanglement and *memory* gets more experimental relevance if we consider, as recently discussed in [15], that gravitational waves may leave *traces* in the fabric of SpaceTime.

These *surface events* leave *prints* in the local fabric as new geodesic in the Absolute Time and a new local entangled geometry of space left in the local memory of the bulk, like an *echo*.

To describe the propagation of information in an entangled AdS memory buffer, we could theoretically *decompose* in *phases* the propagation of the information inside the *bulk-buffer* during a complete entangled *pulse-cycle* of Absolute Time.

As in quantum computers anyway, we couldn't really *see* what's going on in the bulk without destroying the entangled memory. We can only *measure* the results on the surface at any given *local Now*.

Between each new T<sub>k</sub> a complete cycle in the bulk *metaphorically occurs*. Starting at @T<sub>k-1</sub> from +F@T<sub>k-1</sub>, the entities on the surface are accounted for both *persisting knowledge* and local *transformation*.

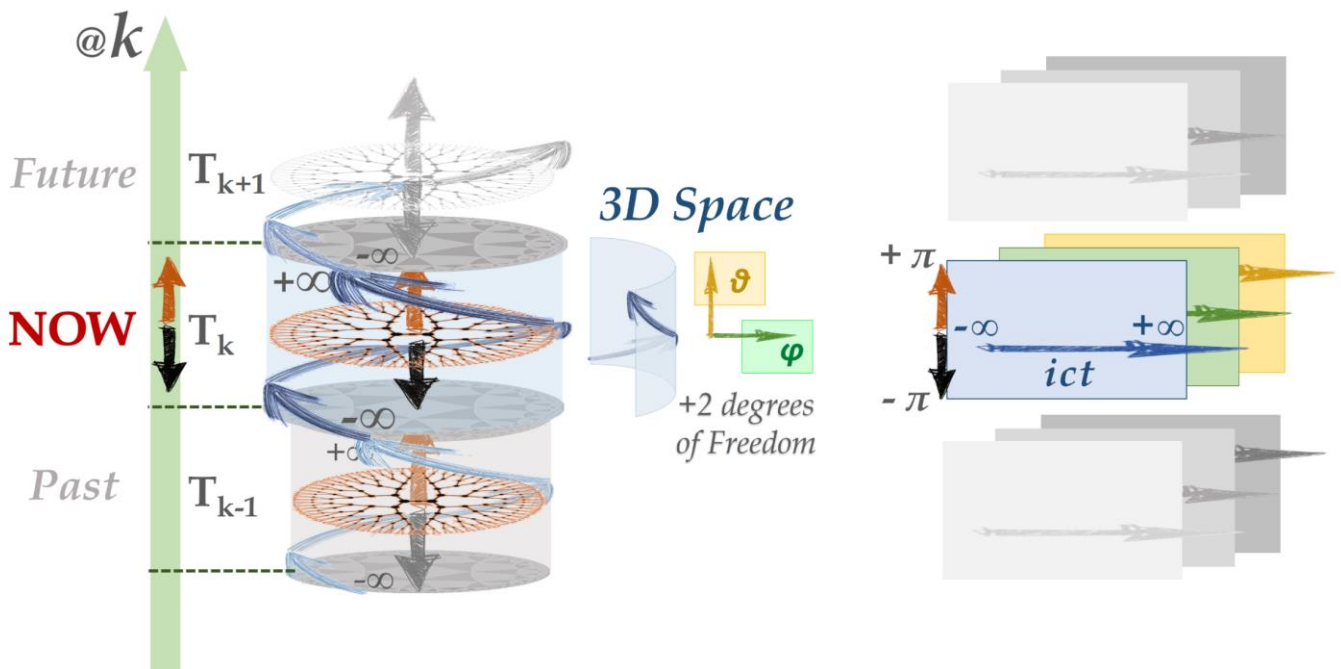
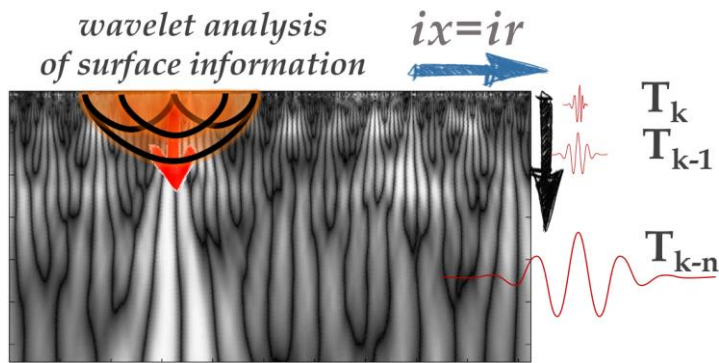
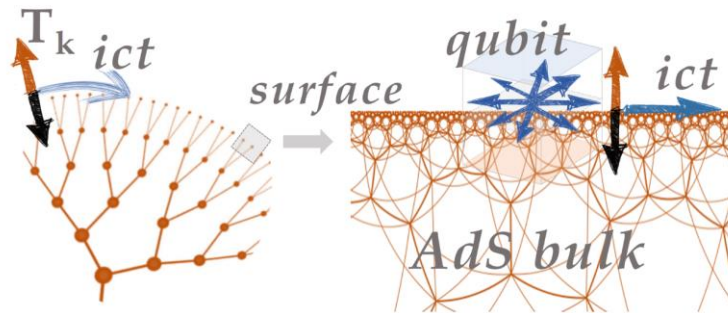
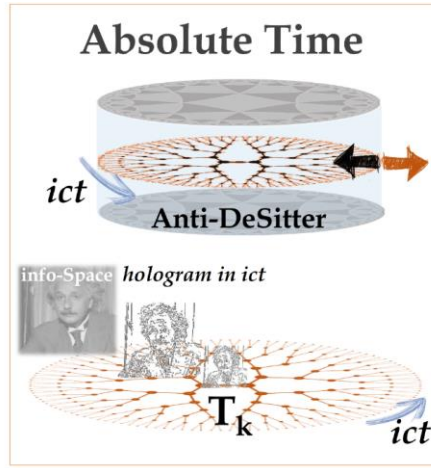
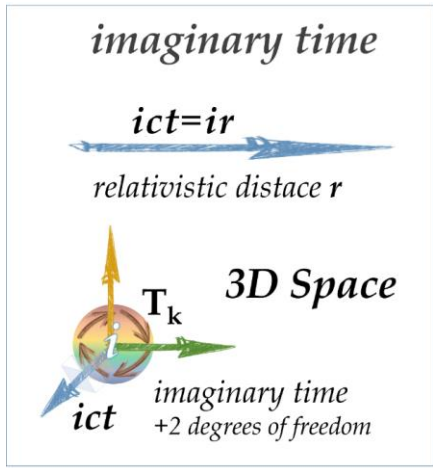
The *pulse propagates* the entangled surface information in the SpaceTime memory bulk (wavelet decomposition) till the last *echo* of memory in the *core*.

From the core, the information propagates back in the entangled bulk memory of Absolute Time, as in a deep neural network *image analysis and re-composition* through the *most efficient codec*.

On the surface, the memory is resolved as the *hologram* of from a surface pulsing in a local 3D *probability space*, with a given radius in *ict*. The new local interactions that occur at T<sub>k</sub> are then accounted and perceived as the *current 3D Reality of coherent Now*.

Even in the absence of perceived motion, entangled surface points assemble as networks through additional links of information, as phase shifts coded in the pulses along T<sub>k</sub>. The common beat identifies *distances from the barycenter* of the *Absolute local beat reference* and eventually connected strings that oscillates locally according to memory and the coming new *stimuli*.

Eventually, at every cycle of Absolute Time, 3D Space emerges from  $-\infty$  to  $+\infty$  in the imaginary time and the chance of 2 degrees of Freedom. We should then follow Feynman and Hawking paths on the *imaginary time*, connecting distances and points in wider networks, while deriving exponentially along the Absolute Time, to highlight coherence and understand patters in the evolution of the information space along both times.



# Living on the Surface

## Few bits of SpaceTime

Consider SpaceTime as a coherent fabric of Info-Space (made of tiny surface bits) developing along *imaginary time* (diffusive in 3D Space) and *Absolute Time* (connected to a *pulse in time*, as energy and information stored in a *persistent memory* at each tick).

Consider *resting* energy as a network of imaginary qubits, distributed in *ict* and entangled in a coherent pulsing *Self*, acting as *tensors* curving the local surface.

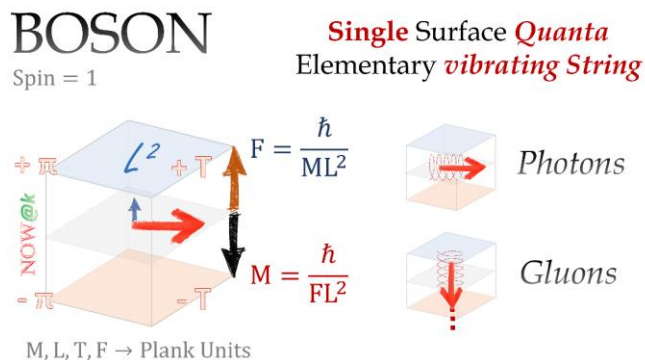
Consider, in this imaginary inflated 3D Space, a bit of SpaceTime, collapsing the entropy to a single surface quantum bit of Information-Space in the Absolute Time.

Given a single qubit of SpaceTime (or *Quanta* of Information Space), we can picture a gauge boson as a vibrating string with a pulse in the Absolute Time stored in the surface bit of SpaceTime. The frequency emerges as a wavelength in the propagation along *ict*.

A single boson, having no roots and no links, has no inertia or rest-mass.

Photons propagate at *c* in the entropic surface *space* carrying the *lightest bits* of information. Weak bosons try to keep coherence in Time and Space, decaying in *ict*. Gluons keep coherence in Time entangling in massive particles (as in [16]). Gravitons (supposed Spin-2) keep coherence at *c* in both the imaginary space and the Absolute Time, leaving a trace of their passage in local SpaceTime memory while propagating at *c* in *ict*.

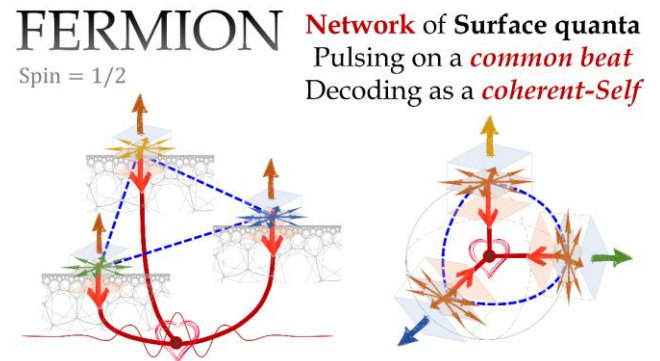
Additional interpretation of Bosons will be given in the final Annex.



The natural entanglement of quarks with all 3 different color charges in a stable massive particle (with no color charge) could be interpreted, from this perspective, as a gained equilibrium phasing at  $\pi/2$  from *ict* within the  $2\pi$  of the coherent Now. The gained new complex equilibrium could be interpreted through of the orthogonality of Absolute and imaginary time *momenta*.

Entangled gluons storing information averagely at  $\pi/2$  from *ict* nulls averagely the momenta in the imaginary time within a volume of probability, as the natural *ict* momentum *rotates* toward the orthogonal Absolute Time on all the points of the Surface of Existence, persisting at every  $2\pi$  of Absolute Time.

The average phase at 0 or  $\pm\pi/2$  allows stable persistence of Fermions in the Absolute Time.



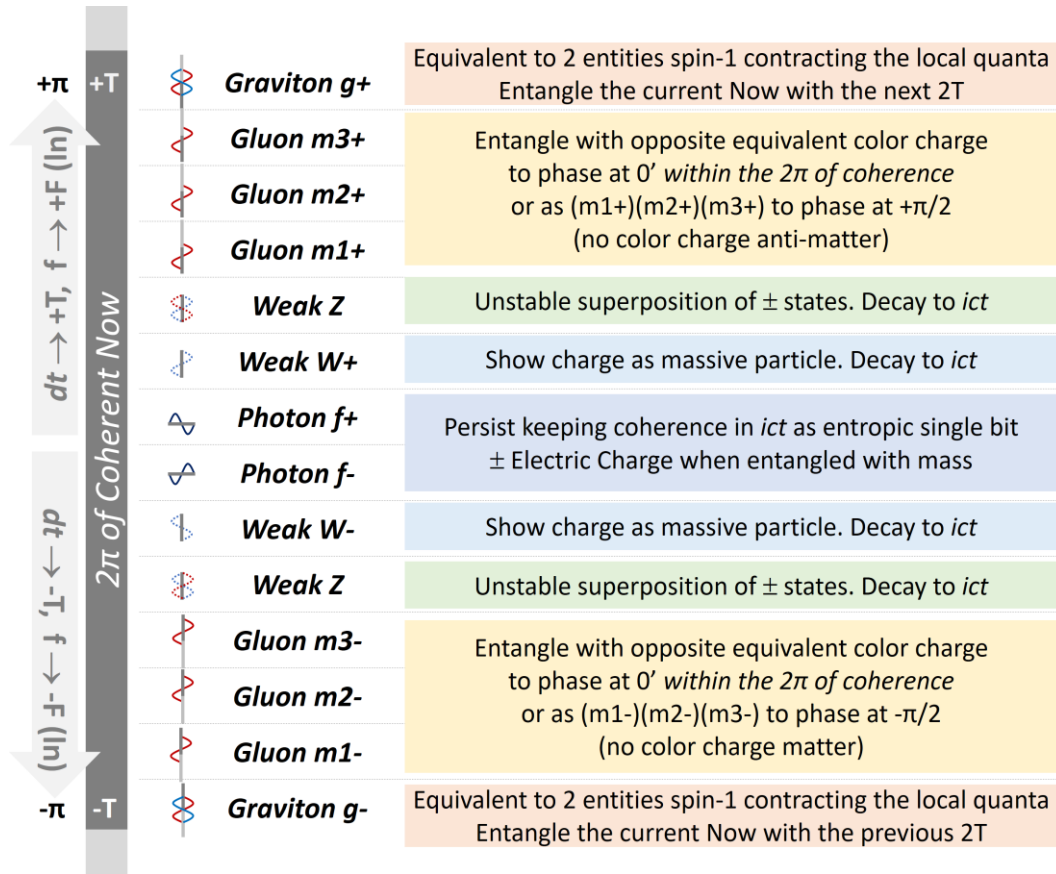
In a probabilistic description of matter and anti-matter in space, we can consider the description of a *Dirac see*, perceived not as *below* the current probabilistic *Now* but as *raining* from above and in the future *ticks*:

- an electron is the volume of space, identified by the minimum Surface of Existence, where probabilistically I find an electron with  $p=1$  at the possible next interaction at  $T_{K+1}$
- an anti-electron is the volume of space identified by the minimum Surface of Existence where probabilistically I find an electron with  $p=0$  at the possible next interaction at  $T_{K+1}$

When these 2 volumes of information space collide, the local SpaceTime *paradox* results in the local entangled energy to be released in diffusive energy, as thermodynamic radiation on the surface of the bulk, flowing entropically on the imaginary time.

The same phenomena could be described as an overflow in surface free single string-qubits of info flowing in *ict* (photons), result of a *surface algorithm* accounting for *opposite* pulsing entities on partially superposed and independent *Selves* and relative Surface of Existence.

Giving the opposite phase shifts at  $\pm\pi/2$  to *ict*, matter and anti-matter result *pointing towards* opposite direction in the Absolute Time while pulsing in the same coherent *Now*.



## Surface Networks and *momenta*

In the proposed description each particle-entity is distributed as entangled Information Space of over a *Surface of Existence*, composed of many *bits* of size  $L^2$ , described by the *Surface of Existence*  $S_E(ir_E, \vartheta, \varphi) |k$  (related to the *wave-function* of the particle, as we will further see).

Consider, per each element of the virtual surface of an entity-particle, a contribution  $m_i$ , positive or negative according to the pulse phase shift in Absolute Time.

Each  $m_i$  could be seen as a qubit and a *string* between *pairs of imaginary points in space* (local tensor on SpaceTime geometry) and *additional local coherent energy*, stored in the information of a *local phase shift* from the Absolute Time reference pulse.

All the qubits pulsing in  $T_k$  accounted together could be interpreted as a wave-packet and a *frequency of occurrence over time* of a 2D Information-Space Real projection and a distribution of *imaginary momentum* along (*ict, θ, φ*), given all imaginary time and directions.

Eventually the wave-function seems a pulsing *membrane of probability with blurred contours* and a *3D shadow* of a *4D Self*.

Given  $m$  as the mass of a massive elementary particle,  $S_E$  as the ideal *virtual surface defining the volume of the particle* and  $r_0=0$  as *barycenter*, we can consider:

$$\#_s \leq \frac{\text{Area}(S_E)}{L^2}; \quad m \Leftrightarrow \sum_{i=1}^{n=\#_s} \frac{|spin_i m_i|}{|ir_i - ir_0|};$$

$$\frac{|spin_i m_i|}{|ir_i - ir_0|} \leq M = \text{Planck Mass } (\forall m)$$

The virtual surface  $S_E$  includes the volume of 3D space where the entity could be *statistically found when the wave-function collapses* (e.g. electrons orbital, photons wavelength).

The quantity  $\#_s$  is intended as the *Information Space Cardinality* of the particle Entity, counting the ideal points that identifies the *projection on the surface* of the energy/information locally entangled in Time.

For a massive particle, we can consider the momentum along the *imaginary time* as connected to the collective probability of moving of all the entangled  $m_i$  qubits.

Consider, per each  $m_i$ , a proper  $p_i$ . The collective contribution of all  $p_i$  leads to equilibrium in the perceived *3D shape of the packet*, forming a *coherent Self* with all the other *qubits*  $m_i$  thanks to entanglement (common memory) in Absolute Time.

We can describe each particle in its 3D space distribution (through the momentum and the wave function over a probabilistic *imaginary coherent time*) or consider it as a *Network-Entity* of entangled information points (distributed in imaginary time) and as a *coherent Self*, coded in the bits of entangled memory and stored along the Absolute Time buffer.

An elementary massive particle of rest mass  $m_0$  keeps its *network state configuration* in the Absolute Time, *persisting* and self-decoding in each instant as a *local phase shift* proportional to  $m_0$  in reference to the Absolute Time beat.

Each Entity, emerging in 3D space as a wave-function, can be seen as the result of the projection of the Network entanglement links in memory, pulsing with characteristic local phase shift along the ticks of the Absolute Time.

Each link is *pulsing as a string* phase-shifted in the Absolute Time and identifies (with all the entangled others) a *volume of space on a common beat*, like a *persisting tune*. This *local combination of notes* (phase shifts) persisting as packet of entangled qubits in the local memory of the Absolute Time results in the *Self-Network* projection, existence and persistence in the Absolute Time.

The 3D behavior in space follows spherical harmonics function of  $m_i$  becoming relativistic and, depending on the additional energy to the resting condition, shows increasing degrees of complexity in the perceived 3D imaginary space.

We can call *Time Momentum*  $\mathbf{p}_T$  the Network-Entity projection over the Absolute Time, as the result of all the entanglement strings vibration, coded in the common local phase shift relative to the pulse of Absolute Time. From a TLC perspective, the momentum in Time  $\mathbf{p}_T$  could be interpreted as equivalent to a *Self-decoding reference* (common among the collection of  $m_i$  composing the entity) relative to the pulse of Absolute Time.

In a *wavelet decomposition* of energy levels in a local volume of space,  $\mathbf{p}_T$  is like the *local ground level* of the energy distribution. It is stored in a wider wave (deeper in the *memory buffer levels* in time) and represents a *minimum entanglement information* common to all the imaginary points belonging to the same  $m_0$  (hence pulsing on the same  $\mathbf{p}_T$ ) in its probabilistic existence in space.

From the proposed perspective, the wave-function of an elementary particle could be decomposed at each  $k$  as:

$$\psi_{E@k} = R_{k,ix} e^{-iS_k/\hbar}$$

The events at  $k$  follow the propagation along the entangled memory roots, resulting in each given *Now* in a point-particle in 3D space at given distance  $ix=ir$  in *ict* from the barycentre, taken as Absolute Time reference.

The particle *emerges* as an *inflated hologram* in 3D space of the information integrated over the ticks of  $T_k$ .

The momentum in Time of a particle describes then the *entanglement information* of *qubits* connecting *distant points* in *ict* that *encode* as a *coherent Self* in  $T_k$  and assure Persistence in Time of the particle. In the *decoding of the Self* through its *pulsing roots* along  $T_k$ , the Time momentum describes eventually the *distribution of the rest-mass* in *ict* (3D Space) as *Energy probability density* and *Position of  $m_0$*  that manifests *inertial mass* as a *resistance*, in the Self-decoding of the Entity through the roots, to additional info in *ict*.

It is the real essence, true Self of the particle as a network of information persisting in the memory of SpaceTime.

The emergence at each tick of the point particle  $m_0$  in different *entangled spatial position* within the wave-function becomes *Quantum Potential* and the average local curvature of SpaceTime, as a tensor on the surface (3D Space) acting from the dimension of Absolute Time.

Entropy, connected to the first order derivative of the particle emergence in *ict* from the roots at each  $T_k$  (as shown in the coming chapters), becomes a summary of the *evolving information* and the intermediate logical step between the energy density of the wave-function and the Quantum or *Information Potential* (as second order derivative).

The entropic distribution in *ict* at each  $T_k$  of the point particle seems *locally sewing the fabric*, contracting SpaceTime in a manifested curvature.

The correlation between Quantum Potential (curvature of the Real part of the wave-function) and General Relativity has already been discussed in [17].

In this contest, the global particle spatial momentum becomes additional information in *ict*, increases the *spatial frequency*, reduces the uncertainty in the direction of motion (reducing the De Broglie  $\lambda$ ) and *compresses* the inflated 3D shape.

The evolution of entities in 3D space derived in the wave-function can be seen as the result of the occurrence of multiple *un-perturbed samples* in  $T_K$  of the *entity-Self*.

The *snapshot* at each  $T_K$  of the path-integrated imaginary 3D space reveals the *distribution of probability* of the Entity in 3D space along its Surface of Existence, as an *entangled imaginary information space*, pulsing as a spherical harmonic and evolving on  $T_K$  in the flowing of *ict*.



The description of particles as *evolving quantum networks* storing *entangled phase information* on a discrete time in a fully comprehensive *lab-system state* has been discussed in [18].

In the limit of SpaceTime itself being the *lab*, it could be seen as coherent with the proposed conjectures.

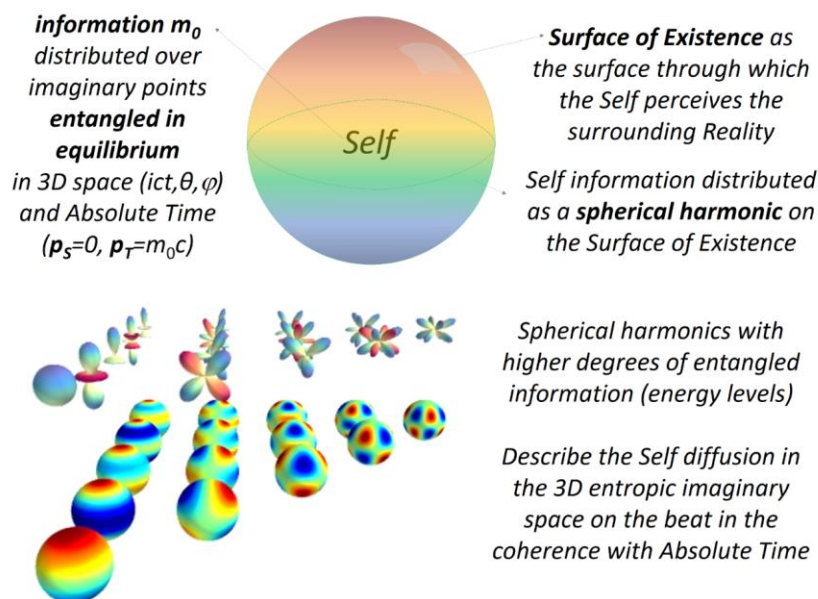
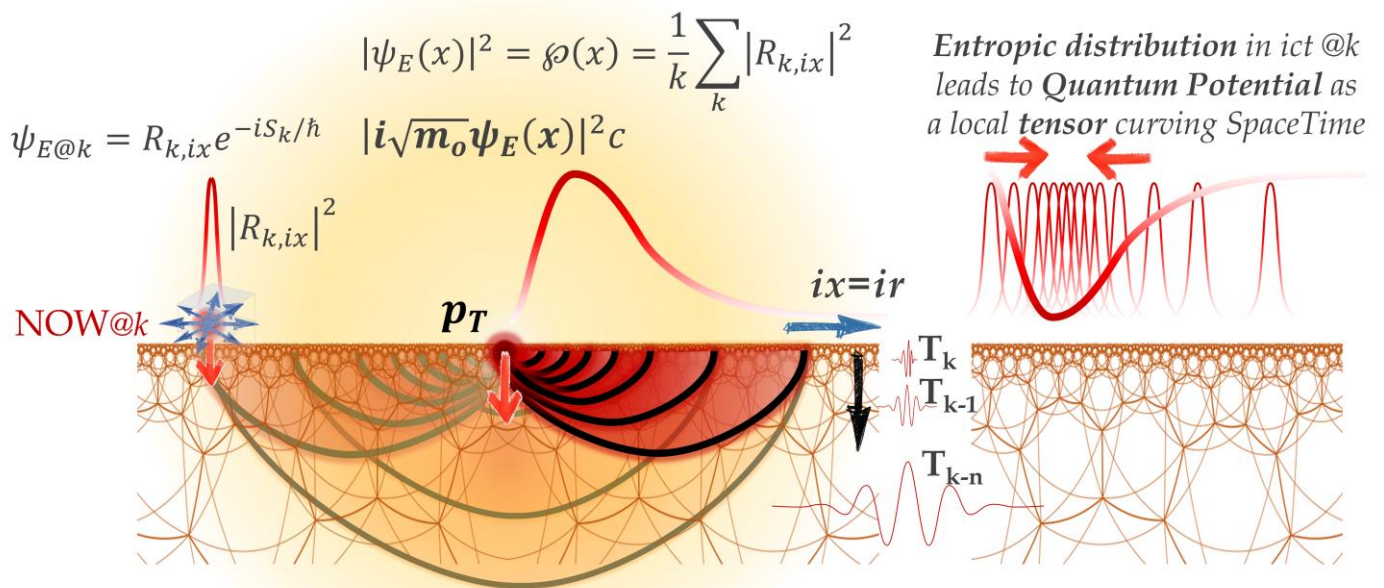
*SSQM* derives the probability of decaying in the *Zeno paradox* as a function of the whole system and the evolution of a *Heisenberg-net* of entangled qubits over  $k$ .

It could be interpreted as focusing, in each *instant*, on the current correlation of *Observers* (as space-bits in *ict*) and *Signal operators* (information entangled phase in *ict* at  $T_k$ ).

Similar picture could be derived following the concept of a *Lattice Dynamics*, discrete in Space and Time, as proposed by Margolus in [3].

A *Finite-State Classical Mechanics* model describes evolution through discrete positions in space (nodes  $\leftrightarrow$  qubits) on a discrete tick, offering a similar perspective.

The basic evolution rules involved are often referred as *cellular automata* models.



## Relative averages

Giving a 4D fabric of SpaceTime and a 2D holographic Info-Space, we can consider 2 *time*-dimensions.

The first is perceived in the *inflation* of 3D space *Entropy*, as an *imaginary time* diffusive on information in every possible direction, while the last is derived as a local variance in coherence with an *Absolute beat* via entanglement (defines rest mass as connected information in equilibrium from the *external entropy* of local 3D imaginary space).

Related to these 2 ideal time dimensions, we have mentioned 2 *momenta*:

- $\mathbf{p}_S = \text{Space momentum}$  over imaginary time, related to the entity *relativistic mass and speed in space*
- $\mathbf{p}_T = \text{Time momentum}$  over Absolute Time, connected to the entity *beat, rest-mass and position*

These *momenta* define the Energy and the evolution of a network-particle in the Information-Space and its *holographic projection on the surface of existence* in our perceived “3D-space + 1D-time” SpaceTime.

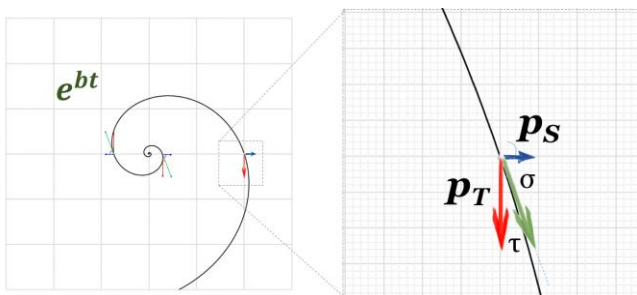
To picture the momenta defined as vectors in SpaceTime, consider a Log Spiral (*Spira Mirabilis*) defined as  $r(t)=e^{bt}$ .

In each point of the curve, we can identify 2 angles:  $\tau$  is the distance between the tangent and the circle passing for the same point (also called *pitch*), while  $\sigma$  is the distance between the tangent and the radial line. In a Log Spiral,  $\tau$  and  $\sigma$  are constant and define the spiral shape.

$$\tau = \arctan(b) = \frac{\pi}{2} - \sigma$$

The *SpaceTime momentum*  $\mathbf{p}_{ST}$  follows the spiral tangent and it can be seen as a combination of an *imaginary momentum* along space ( $\mathbf{p}_S$  following the radial line related to the imaginary time, like *additional info* in the *Self-decoding*) and a coherent *rotation vector* ( $\mathbf{p}_T$  tangent to the circle with same radius) connected to the  $2\pi$  revolution in time every  $2T$  (and Absolute Time pulse).

The following picture describes the mentioned vectors.



A *flat* coherent SpaceTime is the result of the local perceived perpendicularity of the momenta along the Absolute Time and the imaginary time.

Starting from relativity *4-momentum* and the 2 *momenta* described, consider the following equations for an entity of rest mass  $m_0$ , speed in space  $v_s$ , and relativistic mass  $m$ :

$$\beta = \frac{v_S}{c} = \sin(\tau); \quad \gamma = \frac{1}{\sqrt{1 - \beta^2}};$$

$$\frac{1}{\gamma} = \sqrt{1 - \beta^2} = \frac{\sqrt{c^2 + (iv_S)^2}}{c} = \cos(\tau)$$

$$@_T = \frac{v_T}{c}; \quad m = \gamma m_0 = \#_S m_I;$$

$$b = \tan(\tau) = \frac{\sin(\tau)}{\cos(\tau)} = \beta\gamma;$$

$$\int_{\beta=0}^{\beta=\beta} \gamma(\beta) d\beta = \arcsin(\beta) = \tau$$

$$b \cong \beta \cong \tau \quad (v_S \ll c)$$

$$\mathbf{p}_S = @_T * mc * \beta = (@_T m)(\beta c) = m_{@} v_S$$

$$\mathbf{p}_T = @_T * mc * \frac{1}{\gamma} = \left(\frac{m}{\gamma}\right) (@_T c) = m_0 v_T$$

$$E^2 = (\mathbf{p}_{ST} c)^2 = (\mathbf{p}_T c)^2 + (\mathbf{p}_S c)^2 \quad \forall m_{@}$$

The *momentum in Time* is the global pulse, as a *self-revolution* in the information space of each composing  $m_i$  in a periodic way in coherence with the Absolute Time reference pulse (that allows a *coherent self-decoding* in SpaceTime of the Entity, like a common code shared among all the vertexes of the network-entity and memory of the common ground energy).

*Slower pulse rates* are equivalent to local greater *phase shifts* in the Absolute Time phase-space, to account for more local information as mass.

The *momentum in Space* describes the evolution of the entity in 3D space through the probabilistic group evolution of the *qubit*  $m_i$  composing the wave packet.

In the emergence on the Surface from the root in the bulk, the momentum in Space acts as additional surface *info* in the decoding of the position of  $m_0$ . It deforms the spherical equilibrium in 3D space to an oscillating behavior and reduces the *perceived wavelength* in the direction of motion (increasing the *imaginary frequency* related to speed in space and hence spatial resolution).

The speed  $v_S$  is intended, giving all  $m_i$ , as an *average group speed* of the packet of qubit.

The speed  $v_T$  should be intended, considering all  $m_i$  in the packet, as a *group coherence in time*. In fermions, giving their coherent static persistence in space, it is equal to  $c$ .

The quantity  $m$  defines the relativistic mass as a combination of imaginary qubit (ideally distributed over  $\#_S$  points and entangled in a coherent local pulse through the root in the Absolute Time).

The quantity  $m_0$  is the *rest mass*, as the mass when  $v_S=0$ , which is equivalent to the *inertial* mass and it is related to the *inertia* along the Absolute Time. It is energy and information stored in the coherence with the Absolute Time and manifests resistance to additional 3D space imaginary entropy.

The *inertia* is related to the *resistance to additional imaginary space information* in the equilibrium configuration of the composing  $m_i$ , as inertia in momentum ( $v_S>0$ ) on the imaginary *ict* time.

The factor  $1/\gamma$  counts as a *Self-reduction*, to see the inertial mass over the Absolute Time in each pulse and highlights the gravitational information due to the static imprint on Time. It's a transformation on the  $\mathbf{p_S p_T}$  plane to *see* the projection towards  $\tau \rightarrow 0$ .

If, in the current *Now*, 3D space is an integral over all *ict*, the quantity  $@_T$  (*coherence with Absolute Time*) defines a difference in *framerate*, intended as the entity evolution over the window of  $2\pi$  of coherence of the *Absolute Now*.

We can try to visualize a *pulsing probabilistic 3D wave-function* as a *filmstrip* with frames rolling at  $v_T$  on which the window of *current coherence* shines light at  $c$  at each instant  $T$ , showing the *Coherent Mass at Now  $m_@$*  in all its 3D *freedom and connection* in *ict* (as in an *eye-diagram* typical in electromagnetic telecommunication).

The quantity  $m_@$  is the *coherent mass* (relativistic mass coherent in the 4D *Now*). It is measured on the coherence of the *imaginary time* and the coherence of Absolute Time.

The value of  $b$  in  $r(t)=e^{bt}$  ( $b=\beta\gamma$ ;  $\arctan(b)=\tau$ ) determines the Self-centric perceived SpaceTime.

When  $b=0$  ( $v_S=0$ ,  $\beta=0$ ,  $\gamma=1$ ,  $\tau=0$ ) the spiral collapse in the unitary circle, as a perfect clock still in space and an inflated orthogonal direction to *ict*. When  $b$  goes to infinity ( $v_S=c$ ,  $\beta=1$ ,  $\gamma\rightarrow\infty$ ,  $\tau=\pi/2$ ) the spiral develops as a line, or a *ray of light* from the origin. In this extreme condition, the dimension of space becomes equivalent to Time and the *circle flattens*.

The combined SpaceTime momentum accounts for both the pulse in Time and Space. It's conservation accounts for the conservation of Energy and the conservation of momentum (usually intended as Space momentum when  $P_T$  does not change).

In a Quantum Mechanics description, *SpaceTime momentum* could be intended as well as a *Hamiltonian operator*.

# Reality and Information

## Newtonian tempo

Gravity could be seen as the information flux of a gradient in Absolute Time beat, given by the pulse in the Time Momenta over the imaginary distances.

The *reduction* of the local pulse frequency is equivalent to a *stretching* of the local pulse *perceived duration*, like the *extra buffer needed in Time* to save information for that  $m_o$  in the local Information Space. Giving the lengthening of the local period, the gravitational distortion of SpaceTime is equivalent to a *reduction of the beat-rate* of the local 3D volume and a phase shift in the coherence with the pulse of Absolute Time.

The gravitational field (as the SpaceTime distortion in the surrounding 3D imaginary information space) caused by a body of mass  $m_b$  is the result of the flux of the differential of potential in the Absolute Time through an imaginary surface that surrounds it at given imaginary distance  $ir$  from the ideal center of  $m_b$ .

From this perspective, the Newton force could be seen as a gradient in the phase-sync with the Absolute Time beat and the information of a *nearby slower beat*, stored information and possibilities.

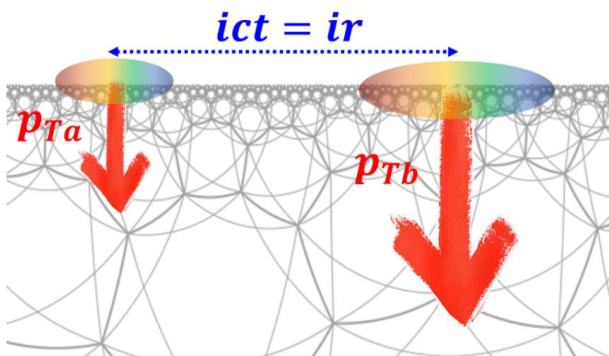
Mathematically, the force of Gravity acts as the combined angles of relative perception, coming from  $p_T$  over the imaginary distance in space  $ir$ , in reference to the Planck reference of *Length in Space* and *Mass in Time*.

$$p_T = m_0 c; \quad ict = ic(nT) = i(nL) = ir$$

$$F_g = \frac{L}{M} \frac{p_{Ta} p_{Tb}}{ict \ ict}$$

$$= \frac{L}{M} \frac{1}{i^2} \frac{m_a c * m_b c}{(ct)^2} = - \left( \frac{L}{M} c^2 \right) \frac{m_a m_b}{(nL)^2} =$$

$$= -G \frac{m_a m_b}{r^2}$$



## Dirac and Shannon

Dirac equation could be interpreted from the perspective of *imaginary time*, Absolute Time (as a *coherent* time in local SpaceTime) and the SpaceTime momentum defined.

$$(\mathbf{p}_{ST}c)\psi_{x,t} = i\hbar \frac{\partial \psi_{x,t}}{\partial t}$$

$$-i \frac{E}{\hbar} \partial t = \frac{1}{\psi_{x,t}} \partial \psi_{x,t}$$

We can describe the information in a decomposition over bits of space in the current Now  $|k$  from the perspective of the *center of the Self*, as if the whole space were relative to the Entity *barycenter*.

We can consider, in each element of size  $L^2$  of the surface at distance  $r_i$  from the barycenter, a decomposition with a wavelet transform according to *Shannon mother wavelet*, based on *sinc* function and an order  $k$ .

$\hat{i} = [x_i, y_i, z_i]$  = space versor;  $\hat{ir} = \mathbf{r}_i$  = distance from the center;  $\int_{ict} |k, dt \rightarrow T$ ;  $s_i = \text{spin}$ ;

$iS_E |k =$  distribution in 3D space of *position of existence* of  $m_i$  information @T<sub>K</sub> (surface bit info), as energy density.

$$S_E(r_i) |k = \left( \frac{+is_i L}{r_i} \right) \left( \frac{-is_i L}{r_i} \right) \psi^{(Sha)}(r_i^\perp) |k$$

$$-iS_E(r_i) \frac{E_i}{ML^2 F} T |k = \ln(\psi_{k.Now})$$

$$\sum_k S_E(r_i) |k \Leftrightarrow |\psi_x(\mathbf{r}_i)|^2 \quad \mathbf{ir} = \mathbf{r}_i = (ir, \varphi, \vartheta)$$

Inverting the above calculation, we can derive the Entity entangled info in the Now, given imaginary info and Absolute coherence over the quantum scale  $E_0 = ML^2 F^2$ .

$$\psi_{k.Now} = e^{-iS_E(r_i) \frac{E_i}{E_0} |k}$$

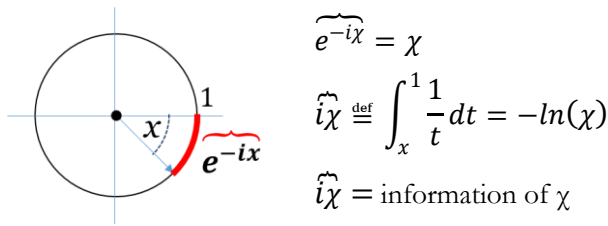
To represent the *information* of an Entity, we can project the info evolution over the Time of Existence.

The obtained *Root of Existence* will represent the information included on the Surface of Existence evolving over the Absolute Time.

Given  $T_E[k] = \text{Time of Existence}$ , intended as the windowing function in a progressive wavelet decomposition according to  $k$ , we can define the *Root of Existence* as

$$\psi_{E@k,i} \stackrel{\text{def}}{=} T_E[k] e^{-iS_E(r_i) \frac{E_i}{E_0} |k}$$

To describe the evolution of states in a bit of SpaceTime, it could be useful to consider the concept of *Arc of Existence*, as an expression of an entity associated intensity/information/occurrence over Time. Eventually, it is a change of perspective on a log spiral.



Connected to the *Arc of Existence*, we can define the concept of *Total Entropy*  $h_x$ . It accounts for the total information of  $x$  in the pulses of Absolute Time and the flow of imaginary time, as the possibilities of the information space described giving the experience from Absolute Time perspective, or the summary of the info shown so far on the surface. When we derive the *Root of Existence evolution at each k*, we understand the information of an entity and perceive its Quantum Potential. The sum of the *derived root past known samples* results in the total entropy of the system.

$$\begin{aligned} \psi_E &= T_E[k]e^{-i\chi_k} \\ \chi_k &= \overbrace{\psi_{k.Now}}^k = e^{-iS_E(r_i)\frac{E_i}{E_0}} \Big|_k = S_E(r_i) \frac{E_i}{E_0} \Big|_k \\ \sum_{n=k=T_E}^1 \frac{d\psi_E}{dk} \Big|_k &= - \sum_{k=1}^{T_E} \frac{d\psi_E}{dk} \Big|_k = - \sum_{k=1}^{T_E} \overbrace{-i\chi_k}^k e^{-i\chi_k} \\ &= \sum_{k=1}^{T_E} i\chi_k \chi_k = \sum_{k=1}^{T_E} -\chi_k \ln \chi_k = h_x \end{aligned}$$

Special relativity focuses on the differences along the imaginary time and gives the tools to compensate that distortion in the SpaceTime fabric perception. General relativity added gravity as the instantaneous local bending of the fabric in another dimension, eventually coherent. ADS/CTF mapping, together with the holographic principle, introduced in the frame the concepts of *network* and *entanglement*, *information* and *entropy* over *surfaces* of discrete points. The description through the *Root of Existence* exploits the superposition of  $k$ -entangled qubits of memory of the distribution of  $E_i$  ( $S_E$  in the diffusive, locally coherent and entropic imaginary space).

Entities emerges at every  $T_k$  in the network entanglement of qubits, distributed in imaginary coherent diffusive space along  $ict$  and 2 Real degrees of freedom. The energy density is the real wave-function, entropy, as first order derivative, summarize the reality emergence at different  $T_k$  while the Quantum Potential, as second order derivative scaled on the inverse reality, the consequent curvature.

Given the know past, when we derive over the Absolute Time and integrate in the imaginary time, we reveille the entanglement in the imaginary space, resolve the  $x$  and find the Energy.

When we highlight distances, deriving on the imaginary time flow, and sum samples of evolution over our current *Now*, the Energy blurs in imaginary noise.

## Black Holes interpretation

According to latest holographic theories, the mass of a black hole is proportional to the surface of the black hole and it is equivalent to  $\#_s$  pixels of size  $L^2$  storing maximum mass, as 1 M (Planck Units).

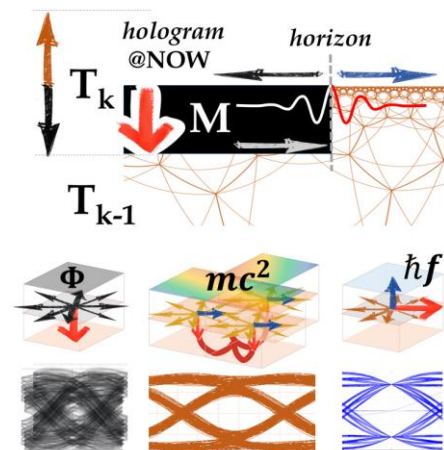
From the proposed perspective, a density of mass equal to 1 M per  $L^2$  is equivalent to a shift of 1 T in the Absolute Time *behind the current coherent 3D Now*.

When the concentration of mass locally reaches  $m=M$ , the additional stored information *sinks* the information space: the shift in the coherence with our 3D perception of *Now* gets so intense that we cannot *decode coherently* the information stored on the surface.

It seems as if, on the surface of the black hole, the 2D Information Space were *left 1 tick behind* the 4D *Now*, with a curvature of 3D space in each point on the horizon that goes to  $\infty$  and even light particles *cannot escape*.

We decode information laying within our  $2\pi$  of *coherence*, calling *Now* a thin  $+T$  *in the future* (as a full F of integrated possibilities) or a  $-T$  *in the past* (as a full M of stored energy in the information space). Each element of a black hole *surface* is entangled and coherent with the rest of the mass, with shift in the Absolute Time that creates a *barrier of incoherence* that prevents information to *escape*.

Information stored in black holes results at least  $1T$  *apart* from our current 3D coherence. The horizon looks like an *eye diagram* on the wrong sync (with *too much phase error* in the decoder) and no information is decoded outside.



The *firewall* description of some theories could then be interpreted as a *membrane of incoherence* of local imaginary 3D space, in which the black hole *hides* its immense coherent info in Absolute Time.

The black hole information is perceived outside the horizon as maximum local SpaceTime distortion, to account and propagate the information of the lowest *perceivable heart-beat* and of the *huge knowledge* locally stored.

On the horizon, the *ict* space rotates perpendicularly towards the Absolute Time. It seems each entity falling into a black hole is *fragmented* in single qubits of maximum mass (as in the most efficient *imaginary space compression algorithm*), stored on the surface *1 tick behind the coherent Now* of the surroundings. Max compression is equivalent to maximum entropy (Shannon) and, from outside, it is impossible to *decode* without *prior knowledge*.

We can imagine the horizon as an entangled surface that increases feeding on surrounding experiences (absorbing new information decomposed in elementary compressed qubits), like a full, dark, logarithmic spiral of entangled memory and a sink with almost no understandable sync on the surface.

When the *current coherent Self* accounts for full memory information and it is still *New*, the *Self* tends to be *golden* as  $\phi$  (or *dark* as  $-\phi$ ) the most *irrational*, to be resolved at the next wavelet in memory and still rich of possibilities, like the most unpredictable and innovative *Self*.

If we took a little step back, looked upside-down and saw everything we know as from the opposite perspective, remembered and repeated we would probably be *huge*.

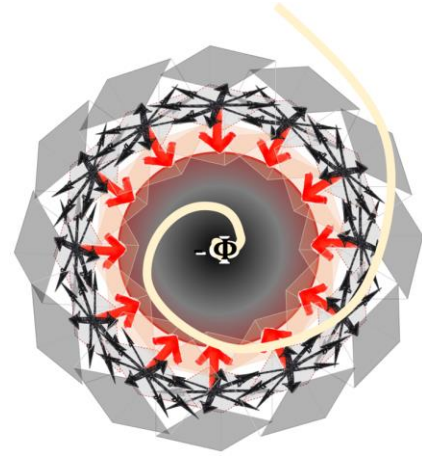
Eventually, more efficiently, the Universe probably prefers to take a little step forward, understand its new root, remember and continue, just like sunflowers.

The golden ratio, in both black holes and sunflowers, is the search for storing the maximum *knowledge* in the memory of the minimum occupied *space*, as the minimum  $S_E$  for the full information.

Eventually, we can see black holes as an immense *coherent-Self* whose calculations and experiences are stored in a region of SpaceTime that looks *incoherent* and black on its Surface of Existence at our current *Now* more than a *singularity*. Alternatively, as seeds, looking at the potential future when they will *break the loop* and decay, releasing their immense knowledge as *Planck stars* (see [19]).

They are the wise *savers* of SpaceTime, *kneading the dough* for future *fireworks*.

<sup>1</sup> if  $x$  can be expressed with  $2n$  standard bits, the root of  $x$  can be approximated to the closest integer with just  $n$  bits, being less than  $2^n$ .



## Algorithms and Efficiency

The golden ratio  $\phi$  is the most irrational number.

Described as a string of binary digits, it will be considered the most *entropic* source.

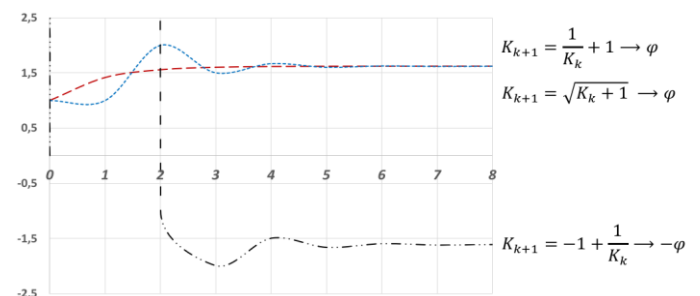
The same is true for  $\phi$ ,  $\phi^2=1+\phi$ ,  $\phi=1/\phi=\phi-1$ .

Eventually,  $\phi$  and  $-\phi$  are the solution to the same generative function, whose positive root can be expressed as the limit of the following convergent series:

$$K_{k+1} = \frac{1}{K_k} + 1 \rightarrow \phi$$

From a quantum computational perspective, seems easier to consider the series of *following roots* on the information @k expressed in qubits, as a square root could be calculated in a string of 1 qubit less<sup>1</sup> and a root becomes simple *halving* in natural log, natural expression of phases. Following a sequence of binary roots results just like a rolling entangled qubit memory buffer.

$$K_{k+1} = \sqrt{K_k + 1} \rightarrow \phi$$



Giving the exponential entanglement of information of qubits,  $k$  qubits are equivalent to  $n=2^k$  computation of  $n$  *digital non-entangled bits*,  $k+1$  qubit are equivalent to resolving a  $2^{k+1}=2n$  classical bits.

If we consider  $ict=ic*(nT)=inL$  (where  $nL$  is, with 2 degrees of freedom, an *absolute positive real distance in the perceived and coherent 3D space* at  $T_k$ ) and  $n$  can vary between 1 and  $k$  at each  $T_k$ , we have described a linear entangled buffer of space. Then,  $k$  coherently entangled surface bits, with 2 degrees of freedom (as a quantum spin and a probabilistic couple of angles), could account for all the *current*  $\infty$  (as everything in *ict* at  $T_k$ ) giving the new entropic information perceived @ $T_k$ .

We can call this *string of qubits* as the *new Knowledge of the Universe to be stored* at  $T_k$  and call  $Me$  the *Memory function* (or memory entangling transfer function), so that the Information stored as *new knowledge* is:

$$K_{NEW} = K_{NOWledge+1} = K_{k+1} = Me * K_{NOW}$$

If an algorithm can summarize, in the most efficient and precise way, the most entropic source of  $n$  qubits of information with  $n-1$  entangled qubits of computational memory, then it seems the most efficient *quantum compression algorithm*, as any other algorithm would need at least *a little bit more*. For  $k$  entangled qubits of memory, as the *current*  $k$  reaches its huge values, the most entangling, rich of information and efficient possible key becomes  $\phi_k$ , as the most irrational  $k$  qubits *codec*.

With just one new full qubit of memory at each tick of  $T_k$  the Universe could follow and optimally approximate the maximum entropic information source of  $k$  entangled bits evolving at each new  $T_k$ .

When the entire Universe *coherent Now* is accounted and a new bit is gained in SpaceTime, as a full pulse of the entangled Anti-DeSitter bulk, we call *Future*.

$$K_{k+1} = Me * K_k \rightarrow \phi * \phi = \phi^2 = \phi + 1$$

In a thermodynamic perception of Quantum Potential, the *imprints* of the CMB seem just like an approximate useful *reminder* of the *key* in *visible* light in the nearby of *+ickT* at each *visible*  $T_k$ .

If an entity shows  $S_E@T_k=K_E@k=K_{E|k} \rightarrow (-\phi)$ , then the perceived local information at  $T_{k+1}$  in the surrounding bits of SpaceTime (on the *horizon* of the entity *Surface of current Existence*) results -1.

$$K_{k+1} = Me * K_{E|k} \rightarrow \phi * (-\Phi) = \phi * \left(-\frac{1}{\phi}\right) = -1$$

In an entropic Universe of increasing surface entropy in the flowing of *ict*, all surrounding surface bits of SpaceTime will *run* towards that *cold* (thermodynamic tendency to equilibrium on the surface), massive and *mysterious black Entity* (gravitational attraction). Eventually, to be absorbed and compress at the same rate of the Universe beat at each pulse of Time.

The ability of an Entity of  $N < k$  bits living on the surface to include the maximum new entropy with a given new full bit gained in its entangled Knowledge is the *Eureka* (as a jump to  $K_{k+1}$ ) and *Evolution*.

The *continuous evolution* is the process for which we constantly entangle and gain new bits of Knowledge, as bits of entangled SpaceTime (at elementary quantum level) or new ledges towards *understanding* and *abstraction* (at our level of complexity), as a gift for our efforts.

The *depth* of an Entity is proportional to the *ability to understand* wider connections, as more entangled information among the entropic reality, searching for a *common ground truth*.

We, *human beings*, are *flatlanders*, flowing on the 2D Surface of Existence in an imaginary coherent time *ict* we call distance, made 3D with 2 Real degrees of freedom. We focus on space in the current Now.

In a perceived relativistic 3D world of a coherent SpaceTime fabric, Intelligence, following imagination and causality, should be enough to understand coherence.

Enlighted beings, following continuous evolution, just gained new bits of abstraction, as a deeper memory root in Time, to rise the Self and see the shadows of Reality in 3D space at each Now.

# Play and Rewind

## The @<sub>1</sub> Network

Following the conjectures proposed, to picture the *Origin* from the proposed perspective we should rewind back both times till *pure superposed imagination* ( $\pm i$ ). See imaginary times developing in opposite infinities, from which *Natural*  $(1)=(+i)*(-i)$  and Time emerged (as a *memory* of new complexity in M and a door to new possibilities in F), as if Absolute Time and imaginary time emerged from a *no-boundary* model (Hartle & Hawking), further developed in recent years in [20].

The entanglement of the 2 times in the *FirsTk1ss* allowed, in the new geometry, the emergence of 2 new relative degrees of freedom, leading to the first pulsing qubit and the @<sub>1</sub>Network, *seed* of the *fabric of SpaceTime*, true first *heart-beat* and vibrating string of our evolving Universe.

The *first qubit of spacetime information* (of 1M *projected over a surface* of  $L^2$  every T, as  $\hbar$ ) emerged as a new *network and link* between entanglement and persistence in *time* and imagination and transformation in *space*.

The newborn connected 4D Universe evolved, thanks to *Quantum Potential* and *Liberty*, on the 2 *momenta*, allowing Complexity, Imagination, Coherence and Entropy to explore the almost infinite possibilities in the local and global Information Space.

The union in the *FirsTk1ss* led to the first pulse of a 4D growing Universe of SpaceTime, growing in both *memories of local greater complexities in the Absolute Time* and *new possibilities in the perceived Now*. A pulsing and growing Universe we describe as a *3D evolving space*, forgetting too often the importance of an Absolute Time (coherent as well with the 2D Information Space and orthogonal to the imaginary time of the inflated 3D space) where the propagation of information has consequences beyond our current understandings.

The beat of the Absolute Time drove the geometry of Universe fabric. The perception of imaginary time defined the local relative description of *time* and *space distances*, always looking for *coherence at c*.

From the beat of Absolute Time, the perception of *time*, as we remember, emerged.

From the flow of imaginary time, together with 2 Real and probabilistic degrees of freedom ( $\vartheta, \varphi$ ), the perception of *3D space* emerged.

Eventually, from the *FirsTk1ss* between Absolute and imaginary time, a 4D causal, relativistic and connected fabric of SpaceTime emerged.

After the *FirsTk1ss*, as in an un-orthogonal distortion in which SpaceTime fabric coherence was not yet met, an *Inflation Era* may have occurred, in which noise was predominant and entities were unable to entangle and stably persist in memory.

When SpaceTime finally acquired coherence and orthogonality, a cyclic spiral combination of entanglement forces (as coherent *notes* persisting on the local Absolute Time) and imaginary *momenta* (as chosen *disequilibrium* to locally evaluate new possibilities) evolved, exploring the infinite varieties of local coherence, selecting for persistence the most resilient and efficient.

Surface Entropy globally increases in the flow of the imaginary time. Entangled complex memories locally grow in the *AdS bulk*, following a tendency to greater local coherence in the Absolute Time, to reach greater local equilibriums in SpaceTime and fight the tendency to disorder and decay, as in an inner desire for coherence and wider future possibilities to explore and include.

Free qubits of Information (as bosons) seem choosing entanglement along the Absolute Time in local concentration of mass and charge, identified as massive particles. *Deep waves of massive gluons fields* and *charged surface vibrations* of the Self-coherence manifest in the flux of information flowing in the 3D space *on it*.

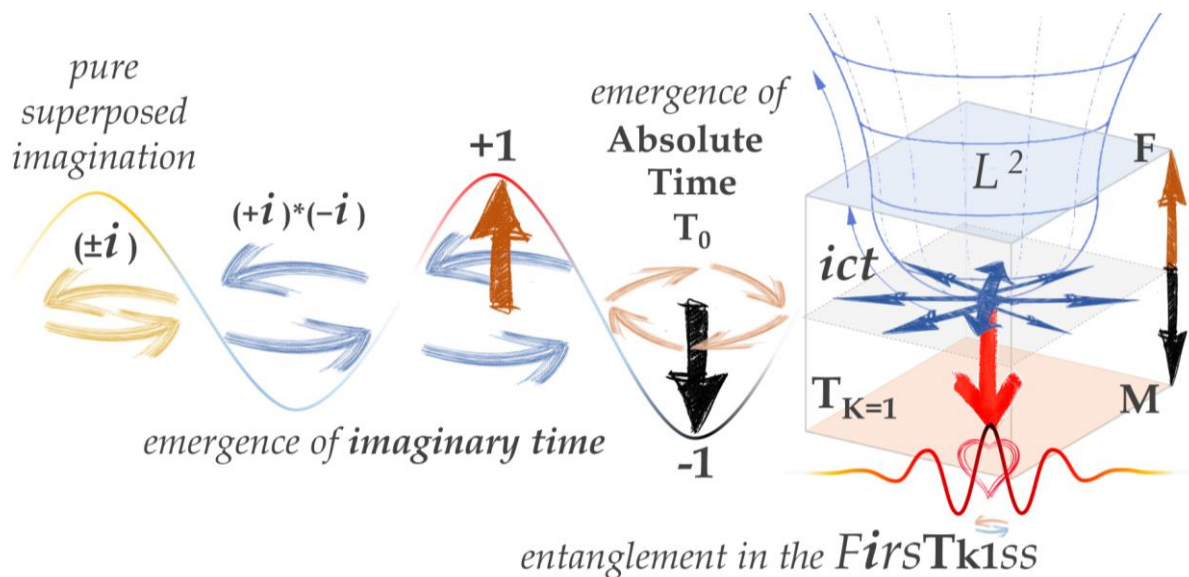
Electromagnetism, as lighter hands and *surface links* diffusing from the highest peaks of massive entities, busted the possibilities of growing complexities and wider coherences, allowing for atomic chemistry and evolution towards even greater complexities and awareness.

The *arrow of possible local complexity* points to wider *coherences*, as being part of a more complex Self, with a deeper and slower beat, a wider range of accounted possibilities and future choices to face or degrees of freedom to use, thanks to the efficiently synthesized memory and wish for interconnection under continuous external imaginary entropic *stresses*.

In the choice of being part of a *local coherent Self*, Entities exist as seeds of coherent information, entangled on a common *code* along the memory of Absolute Time.

Entanglement codes allow the *equalization of external imaginary entropy noise* and the coherent decoding and identification of *being part* of the *complex local Self*, different from the surrounding entropy, as a coherent network sharing a common *identity*, like a *decoding key* to the true *Self*.





## Perspectives on Evolution

In the context of SpaceTime *momenta* considered, we can see the tendency to a *global increase of Entropy* of the Second Law of Thermodynamics from multiple perspectives.

Following the flowing of *imaginary time* on *ict*, 3D *perceived space* increases in *size*, temperatures diffuse and uniform, energy radiates and local absolute frequency *differential information* propagates in *ict* (as information of *local potential* in Charge and Mass), sharing information in a diffusive 3D and coherently connected space, to a global diffused equilibrium of shared information.

Entropy grows, as Entities tend to share information in the 3D Space inflated by imaginary time.

In a coherent development of *momenta* along the flow of imaginary time and the pulses of Absolute Time, while entropy increases globally, it seems complexity (as local entangled information) could increase *locally* when proper conditions of external entropic/information *stress* are met.

Each elementary particle could be interpreted as a *network of information (m)* coherently organized in SpaceTime. The perceived *Self* of the Entity relies in the coherence and persistence of the composing entities, which reduce the *freedom of independent Space-momentum* along the imaginary time to be part of the same collaborative network and greater Entity, sharing common *momentum in Time* for a coherent *Self-decoding*.

New entities emerge under external entropic *stress* as *collaborative networks* of simpler entities, which decrease the local *self-independence* to increase the local common coherence and complexity, as a greater local Self, momentum and information stored in the Absolute Time.

The push to greater coherence under imaginary stresses locally drives evolution towards more efficient ways of saving the complex local information in the Absolute Time against *Self-decay*, exploring new varieties of networks, as entities *information codes* of greater coherence and complexity, evolving to face greater local future opportunities and waves of external imaginary entropy.

Entities, in the flowing of both imaginary and Absolute Time, look for greater persistence as Networks through a search for minimum effort in action and in the efficient storing of past possibilities, as tools to face coming unknown events and possible choices. Higher complexity allows greater possibilities.

In the tendency of global increase of Entropy due to the *diffusion of information*, entanglement seems it could increase locally (as the amount of *stored* and connected information), as a tendency to greater complexities and wider coherence of each Self-entity.

Following the pulsing of Absolute Time, 1D coherent perceived time *passes* and seems to locally entangle (in the Universe time scale) *wider chunks* of information in *coherent local volumes* (identified in the *coherent Self*) experiencing more complex local equilibriums and greater forms of coherence.

Evolution occurs when, from a coherent state of equilibrium, through additional exploration and inclusion of external entropic information through the surface of existence, new *schemas* and *connections* are accounted and synthesized, coherently and efficiently, in a greater local Self, opening new possibilities in the network combinations of the Information Space.

Evolution appears as an alternation of *persistence* and *transformation* cycles, in a continuous perturbation and search for greater local equilibriums. It develops in a logarithmic spiral along the *momenta* over the Absolute Time and the *momenta* flowing on the imaginary time.

The continuous alternation of *external perturbation* and *internal search for equilibrium* in each *Self* pushes for a growth in complexity. It is the search for new forms of *greater equilibrium* for the knowledge locally stored, exploring the many possibilities of the *4D evolving SpaceTime fabric* of our Universe, *existing as a 2D information space, with a time to share and a time to remember.*

The set of *causally connected spaces* within the Universe becomes a closed system within the horizon. There finally the II law of Thermodynamics has its natural perspective, as the surface entropy always increase on the CMB.

When accounting for the II Law of Thermodynamics *diffusive imaginary entropy* only to interpret the evolution of the Universe, we consider the flow of moments in the imaginary time only. We underestimate the value of those *momenta* towards coherence in greater peaks of local complexities that the Universe experienced in each coherent *Now*, as *synthesized information* locally *played and stored* through the entangled beats of the Absolute Time.

*Natural Evolution*, natural tendency to global sharing of information and to local greater complexities, started far before *Biological Life*, as everything in the Universe seems flowing according to the *momenta* evolution along the imaginary and the Absolute Time, tending to an increase of global diffused entropy in 3D space and local temporary peaks of complexity stored in the Absolute Time. *Life* and *Consciousness* are then equivalent to a *local concentration of coherence*, persisting in equilibrium as a *Network* in the Information Space (in the flow of both times) and as *Self*, looking for greater equilibriums and *awareness* (in the coherence of the knowledge stored) through Evolution.

Evolution, at all levels of abstraction (from SpaceTime fabric to natural forces quantum fields, from atomic chemistry, biology and more), seems the natural result of collaborative networks (with common *decoding code* as *beat in Time*, *DNA*, *reference book*, ...) interacting with information and persisting through entangled memory to reach greater levels complexity, for even greater future evolutions. It seems it all started and evolved through entanglement, diffusive sharing of information in a coherent and inflated imaginary entropic space and, eventually, through *collaboration*, to locally share information and create new connections towards greater coherence experienced in the Absolute Time.

The search for local coherence, as the search for *meaning*, seems common to all Entities and *Self*.

The wish for global sharing, on the other hand, seems belonging to natural entities only, which understand and follow natural efficiency and equilibrium.

The prize of acquiring greater local coherence (where more possibilities in complexity could be locally accounted, for greater awareness and freedom of choice) is balanced by the *loss* of the individual imaginary full freedom (as an imaginary *self* and *ego*). It is the *cost* to be part of a greater Entity, persisting with greater *coherent information schemas* and awareness in the flow of both times.

From the perspective defined, Life is equivalent to local awareness, which comes from a local coherence and entangled memory. Evolution eventually is equivalent to choosing with intelligence less *individual imaginary self-freedom*, for greater *collective-entity* knowledge and range of accounted abilities.

We can see how Evolution, searching for local complexities, coherence in entangled information and efficient selection of the explored branches (through *minimum effort or generated imaginary entropy* and maximum *use of the coherent past for a greater awareness*) seems inevitably leading to *Life*. *Biological Life* emerged as a new possibility of locally storing information, as a tool to face future imaginary stresses and possibilities, imagine and experience higher levels of complexity in information patterns and entities interconnection, abstraction, synthesis and awareness. Reproduction eventually is just a trick to ensure persistence and allow transformation of more complex and *fragile Selves*.

Birds use entangled particles in their eyes to *see* the earth magnetic field (causing incoherence in their alignment), plants use entangled particles to efficiently transport energy from the *leaf* to the core (exploiting the internal coherence and minimum resistance), the brain encodes neural pulses and external imaginary information through the *senses* to increase *knowledge*, coherence and awareness. Entanglement and coherence belong to evolution.

In the local perfect balance of Natural growth, we can perceive the beauty of efficiency in the paths along SpaceTime that have *no loss of experience*. In a Fibonacci sequence, for example, the information on the future state  $I@T_{k+1}$  accounts not only for the current state  $I@T_k$ , but also for the known past  $I@T_{k-1}$ , leading to logarithmic spirals and, in the limit, to the golden ratio between present and future states, as the Absolute Time  $T_k$  pulses.

At the same time, we can see how we fail when we lose coherence in Time, entanglement, memory and empathy (*feeling the same*) in the collective existence of our *human race*, guided by *un-natural laws* and *Egos*.

If entropic 3D space is like flowing diffusive imaginary information and Entanglement is a coherent connection among information locally stored in the Absolute Time, we can try to imagine coherence also in the concepts of *Knowledge* and *Intelligence*.

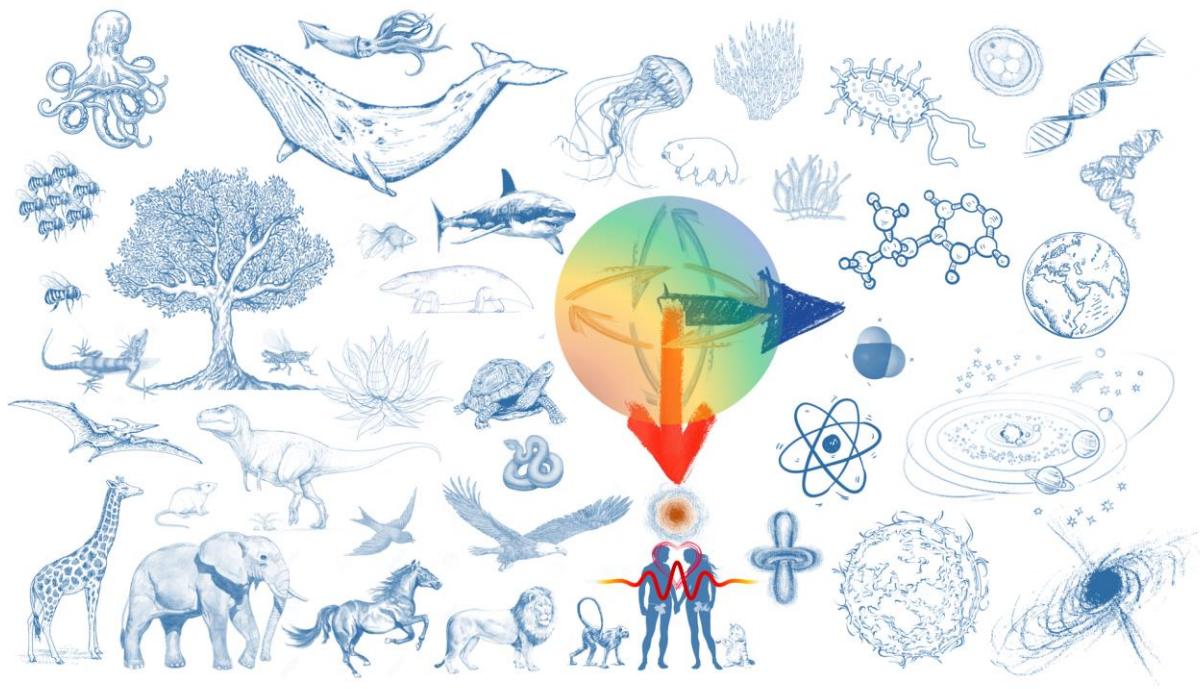
Knowledge is the Self past information shared *within* the network-entity, the coherent information stored in the memory of Absolute Time by local entangled imaginary points (as vibrating strings of information and energy between pulsing pairs) in a coherent, inflated and persisting network-entity.

Intelligence relies in the ability to experience, exchange and include new entropic information as entangled and coherent networks, to extend the Self-complexity and awareness, to increase the possibilities of imaginary abstraction and of unbounded and unpredicted action.

Intelligence is the ability to find meaning in the surrounding imaginary entropy and to entangle with it as a coherent and meaningful network of common experience.

Intelligence is the choice of exploring new entropic information spaces and coherently entangle new pieces of knowledge, growing in complexity, abilities and *depth* to become a better Self.

From the proposed *FirsTk1ss* perspective, it's not about *growing disorder*, *God playing dice* or *losing information in black holes*, but a matter of imagining and experiencing greater levels of complexities, from the *Self freedom* of a diffusive sharing of information and energy, connections and entanglement, while looking for coherence, stronger interconnection and meaning, at all levels of abstractions.



# Conclusions

## Summary

In the context of a discrete universe on space and time, starting from the definition of a *new reference frame* based on an Absolute Time ( $T_k$ ), an imaginary time (*ict*) and on the relative *momenta*, a possible new perspective on AdS/CFT correspondence, SpaceTime fabric and particles has been proposed.

The Absolute Time is described in the *AdS bulk* of the Maldacena correspondence. It is represented as *entangled memory links* (between imaginary points on the surface) that develop highlighting *surface correlation* in a *Shannon-wavelet* decomposition of the *local pulse*. The memory links could be described as well as a *deep neural network* growing in  $T_k$  that *stores* and *project* the evolving surface information. The information *stored* and *projected* through the Absolute Time is interpreted in the context of SpaceTime fabric as the most efficient quantum computation network. Imaginary time, following Hawking intuition, maps the *surface* to a diffusive *space distance* in a relativistic and flat *Minkowski space*, in coherence  $c$  with the pulse of  $T_k$ . It defines, at any given  $k$ , the full current 3D space, from  $-\infty@T_{k-1}$  to  $+\infty@T_{k+1}$ .

The *momenta* involved describe the *phase variations* (along both times in respect to the *reference of coherence*) and develop as in a logarithmic spiral, following a relativistic description of *information space* and *coherent time* on the surface of the bulk.

In an evolving 4D-SpaceTime, the perceived 3D Space *emerges* in each *current Now* as the current configuration of *SpaceTime information* (distributed on the Universe *Surface of Existence* at a given  $k$ ), giving 2 probabilistic Real degrees of freedom in each surface bit and the correlation derived on the memory-links, entangled along the past instants in the Absolute Time. Quantum fields exist on a *surface* (composed of space-qubits of minimum size  $L^2$  and projected at a relativistic distance  $r_i$  in *ict*) that defines over Time a *3D path-integrated probabilistic information space*, thermodynamically diffusive in Energy along the flow of imaginary time and in coherence  $c$  with the pulse of Absolute Time.

Bosons could then be described as *single qubits of information* and *elementary vibrating strings*, flowing with no *inertia* on the surface defined by the imaginary time. They leave no *persisting trace* in the bulk memory: they exist in the current Now as *light skiers on the surface*, *tireless messengers* of information.

Matter elementary particles, as Entities in SpaceTime, could be described as Networks of imaginary points sharing a common beat (coherently decoding as a single entangled Self along the Absolute Time).

They emerge from the entanglement in the Absolute Time of surface qubits, that reduce their local degrees of freedom to become interconnected in the bulk, pulsing as a single, persisting Self (stably or not, depending on the equilibrium achieved in the flow of both times).

In this context, we can consider the Time Momentum as the Entity *beat in time*. It describes the *distribution of the mass in ict* (3D Space) as *Energy probability density* and *Position of  $m_0$*  that manifests *inertial mass* as *resistance to new info in ict*.

The emergence at each tick of the point particle  $m_0$  in different *entangled spatial position* within the wave-function becomes *Quantum Potential* and the average local curvature of SpaceTime, as a tensor on the surface (3D Space) acting from the dimension of Absolute Time

Following the conjectures proposed and the parallel with information *coded* in the entanglement in  $T_k$ , Gravity is described as a gradient in beat-rate and the Dirac equation is mapped to *Shannon Entropy*, as a *summary* of the knowledge *shown on the surface*, calculated as the sum of the first order derivative of the real emergence of the entities.

The geometry described is then applied to Black Holes, as *coherent Self* and networks with maximum surface entropy, resulting on the horizon 1 *tick away* from the *coherent Now* and too *out of phase* in the *current  $T_k$  coherence* to be decoded in our *current 3D space* (consequently with very little chance of receiving, on the *outside*, any information).

The *Golden Ratio*  $\phi$ , symbol of maximum *irrationality*, is taken as the most entropic *sequence of bits* and considered as a possible *decoding key* in the SpaceTime algorithm, exploiting entanglement as *living memory-roots* through past events and looking for maximum surface entropy.

A metaphysical interpretation of the *Origin* has been proposed: Time could have been emerged in a first qubit of *memory* from *pure superposed imagination* ( $\pm i$ ), as in a Hartle-Hawking *no-boundary* description. 4D-SpaceTime seems then emerging, as a *growing fabric*, from the entanglement in the *FirsTk1ss* of Absolute Time and imaginary time. From the *FirsTk1ss*, the first pulsing qubit (of 1M *projected over a surface* of  $L^2$  every  $T$ , as  $\hbar$ ) emerged, becoming the  $@_1$  *Network* and the first possible vibrating string towards  $F$  of *our Universe*.

Finally, to illustrate possible wider similarities and consequences of the model, the Evolution of Network-Entities and of information is described as cycles of transformation in *ict* and new gained persistence in  $T_k$ , in a growing of global surface entropy and local complexities, levels of abstraction, efficiency in equilibrium and *Self-gained* emerging properties.

## Projections

The proposed conjectures seem giving a wider sense to the concepts of *Entanglement*, as a shared memory-link pulsing in each current instant, and of *Existence*, as based on a shared common *beat* or *decoding key* among the composing entities *living in a Network-entity* as a *coherent Self* in SpaceTime.

A deeper comprehension of SpaceTime fabric and particles *true nature* could open the door to new possible ways of producing energy, as the result of an *imposed decoherence* on simple networks via external *phase-shocks*. Breaking the network entangled memory links is the search for each Entity weakness, as the external *noise* leading to *decoherence* and the loss of *Self-equilibrium* in the Network, as causing the entity *decay* in surface radiation (in *ict* of the mass information stored in  $T_k$ ) after having messed up the *colors* in the local mix.

A deeper comprehension of *Natural Evolution and Networks*, existing in the search for persistence and transformation, efficiency in connecting new synthesized complexity and fair sharing of information and energy, could inspire our *human race* before the missing coherence leads to unfixable disequilibrium.

Following the Universe example (as looking for greater levels of awareness, entanglement and empathy with each new *neighbor* encountered through our *Surface of Existence*) could potentially let confused *sapiens-sapiens* evolve to a greater form of *coherent Self*, as an entangled and evolved *network homo-intellegens* living in harmony with all the other entities, pulsing and persisting in the memory of the Absolute Time.

From the *FirsTk1ss* everything seems indeed *connected* in the *living roots* of our Universe.

There is truly no *existence* nor *evolution* when missing coherence, fair diffusive sharing, imagination and memory.

Perceiving the deeper meaning and consequences of these *natural statements* it's up to each one of us.

Eventually, being *Enlighted* seems equivalent to *seeing* entanglement and coherence in the information space, *understanding* connections and correlations, *integrating* the imaginary space-distance, *deriving* over the acquired memories in the Absolute Time while *projecting* in causality the consequences, always ready to imagine and experience external still unexpected entropy with empathy, just following the most efficient and *natural way* to become *aware*, and *evolve*.

Just as the luminous *Universe Existence* and *Evolution* as a coherent and connected *Self*.

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## Annex

### Relativistic Mass

For a particle of rest mass  $m_0 > 0$  and speed  $v_S$  we can consider:

$$\begin{aligned} \left(\frac{E}{c}\right)^2 &= (@_T \gamma m_0 v_S)^2 + (m_0 @_T c)^2 \\ &= \frac{(@_T m_0)^2 v_S^2}{1 - \frac{v_S^2}{c^2}} + (@_T m_0 c)^2 \\ &= \frac{(@_T m_0)^2 v_S^2 c^2}{c^2 - v_S^2} + (@_T m_0 c)^2 \\ &= (@_T m_0 c)^2 \left( \frac{v_S^2}{c^2 - v_S^2} + 1 \right) \\ &= (@_T m_0 c)^2 \frac{c^2}{c^2 - v_S^2} = \frac{E^2}{c^2} \end{aligned}$$

From the above, we can then derive the equation of the Energy of a massive particle as:

$$\begin{aligned} E &= @_T m_0 c^2 \frac{c}{\sqrt{c^2 - v_S^2}} = \\ &= @_T \gamma m_0 c^2 = @_T m c^2 = m@c^2 = mc^2 \end{aligned}$$

For a massive particle, in coherence with Einstein formula, we can consider:

$$\begin{aligned} \mathbf{p}_S &= mc * \beta = mv_S = m_0 * \tan(\tau) * c = m_0 bc \\ \mathbf{p}_T &= mc * \frac{1}{\gamma} = m_0 c = m_0 v_T = m_0 c \\ @_T &= 1; \quad v_T = c; \quad \mathbf{p}_{ST} = mc = E/c \end{aligned}$$

In collisions of massive particles, the Time-momentum of each entity involved in the collision is preserved (unless the entity *decays* and the rest-mass is converted into radiation diffusive over the imaginary time) and simplified on both sides of the equation, resulting in the conservation of (space)momentum and total Energy.

The Kinetic Energy could be defined as the Energy without the Information of the momentum in Time.

$$\begin{aligned} E_K &= E - p_T c = mc^2 - m_0 c^2 = (\gamma - 1)m_0 c^2 \\ v_S \ll c &\Rightarrow \gamma \approx 1 + \frac{1}{2}\beta^2 \Rightarrow E_K \rightarrow \frac{1}{2}mv_S^2 \end{aligned}$$

When a mass entity decays, its momentum in time becomes 0 *at the following tick* and all its associated energy becomes  $\#_S$  photons, single information quanta of size  $L^2$ , moving at  $c$  in 3D inflated space and with given coherent mass, proportional to  $m_0$  for a total conservation of SpaceTime momentum.

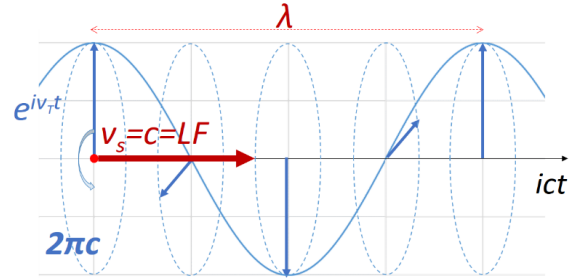
Annihilation of the Self rest mass flips  $v_S$  and  $v_T$  in 4D SpaceTime and converts the Energy stored in the Absolute Time along  $\mathbf{p}_T$  as Energy distributed in the imaginary time along  $\mathbf{p}_S$ , as instant conversion of entangled Energy to imaginary Entropy and Information diffused in *ict*.

Beside SpaceTime momentum for massive particles, we can consider SpaceTime momentum for a massless particle, for example a photon of frequency  $f$ . Consider a photon travelling at  $c$  along the  $x$  direction. The *space variation in  $x$*  is  $c$ . Let  $\lambda$  be the photon wavelength, so that  $\lambda * (f/2\pi) = c$ . Define the number of *spatial ticks*  $n = \lambda/L$ , with  $L = \text{Planck Length}$ .

The photon moves at  $c$  in space, the relativistic mass  $m$  is never at rest and space direction  $x$  for the photon becomes the *reference for variation* in 4D SpaceTime, while the photon propagates, as the *0101* of a beat for a true Self-coherence and *decoding*.

For a photon, the logarithmic spiral on which SpaceTime is perceived degenerates in a line (*ray of light*) where Space is coherent with Time ( $\delta x = L = cT = c\delta t$ ). On this *coherence in space*, its coherence with the Universe beat is kept.

The Time coherence of the photon in space, could be interpreted as the full revolution of the vector perpendicular to the direction of propagation  $x = ict$  on the number of *spatial ticks*, as if time and space along the direction of propagation were equivalent.



$$v_t = \frac{2\pi}{n} c = \frac{2\pi c}{\lambda} L = Lf; \quad @_T = \frac{v_t}{c} = \frac{Lf}{LF} = \frac{f}{F}$$

Thanks to SpaceTime momentum, we can describe a particle travelling in space at  $c$  (so that has *coherence in SpaceTime keeping the beat with the imaginary time flow*) as following:

$$\mathbf{p}_{ST} = @_T mc = \frac{f}{F} mLf = \frac{E}{c} = \frac{\hbar f}{LF} = \frac{ML^2 Ff}{LF} = MLf$$

$$v_S = c; \quad \beta = 1; \quad \gamma \rightarrow \infty; \quad m_0 \rightarrow 0; \quad \#_S = 1;$$

$$m = \#_S m_l = \gamma m_0 \rightarrow M$$

$$\mathbf{p}_T = @_T mc * \frac{1}{\gamma} = \left(\frac{m}{\gamma}\right) (@_T c) = m_0 Lf = m_0 v_T \rightarrow 0$$

$$\mathbf{p}_S = @_T mc * \beta = (@_T m)(\beta c) = \left(M \frac{f}{F}\right) c = m@c v_S$$

$$\text{photon} \Rightarrow m = M; \quad m_0 \rightarrow 0; \quad m@c = @_T m = \frac{f}{F} M$$

The photon is a quantum field vibration and can be described as a 4D entity in SpaceTime.

It is perceived as an *ideal point*, if measured in  $(\vartheta, \varphi, ict)$  3D imaginary space in a given *Now* (interacting with matter). It is perceived, when propagating in an entangled space at every tick of *Now*, as a sail of Info-Energy along all possible  $(\vartheta, \varphi, ict)$  perpendicular to the direction of propagation (reference for coherence), like a wave of information over the variation of Absolute Time.

When a photon hits a massive particle and gets absorbed, the local coherence in time must converge, so  $v_T \rightarrow c$  and, as in massive particles annihilation,  $v_S$  and  $v_T$  flip.

The photon transfers its energy ( $E = \mathbf{p}_{ST} * c = MLf * c = hf$ ) and its last momentum in space ( $@_T \rightarrow 1$ ,  $\mathbf{p}_S = m @ v_T = MLf$ ;  $\mathbf{p}_T = m_0 c$  and  $m_0 = 0$ ), for a total conservation of SpaceTime momentum.

When the photon does not have enough SpaceTime momentum to let the mass *potential in Time* reach a higher level of *stable persistence in Time*, the photon is not absorbed.

It seems information quanta as photons, when useful for evolution, are stored for higher states. If there is no stable persistence in the reached state, the information quanta must be released and remain freely accessible to the neighbors, leading to maximum efficiency in natural phenomena.

## ***Forces and Verbs***

Eventually, we can imagine fields of natural forces (as a 3D coherent fabric) oscillating locally at any given *Now*, with a characteristic frequency in reference to the pulse of the Absolute Time depending on the local energy and information.

From photons (at lower frequencies and pulses travelling alone at  $c$  in 3D space) to weak bosons (unable to keep coherence), then gluons (pairing and able to pulse as distributed massive packets or entangled information strings along the Absolute Time) and graviton-pairs in an increasing energy, or local frequency and deformation of the beat.

While photons keep their beat and move in space coherently, gluons keep their beat in Time (with  $f$  such that a  $\pi/2$  rotation occurs and  $\mathbf{p}_T$  and  $\mathbf{p}_S$  flip), entangling as *pulsing veins, losing a tick to coherently entangle* in a resulting spin  $1/2$  massive particles, to store energy and local information coherently in Absolute Time.

Spin 2 particles could be seen as information strings propagating at  $c$  in 3D space and *contracting* and *entangling* SpaceTime, due to the gained equilibrium and coherence in the superposition of 2 coherent spin 1 entities.

*Natural Forces* carried by bosons are like *verbs* in a sentence, basic *building blocks* from which every *meaning in time* can be derived and every Reality can be imagined.

Gravitons have the strength of *interconnecting past and future*. Like a spring on causality, they are the tension of past knowledge and how much we have *meant in Space during the previous tick*. Graviton is the ***I have BEEN***, as the gravity of our past.

Gluons have the strength of *current Knowledge* and represent the *current bending* of the Surface, as believing in the Energy we will have on the *instant of the evolution* in the coming jump from our *stretched trampoline*. Gluon is the ***I AM***, as the Mass and Knowledge of current Persistence.

Weak Bosons have both the *weight of Mass and Knowledge* and the clear intention of Transformation into Energy. It's the wish to *sacrifice for a greater purpose*, opening new possibilities around us. Weak Bosons are eventually the ***I'm GOING to BE***, as a life promise of Transformation.

Photons live on the surface and has the fickleness and the Energy at its most accessible expression, as the *promise of the height our equilibrium will reach on our transformation and jump*. Giving the flow at  $c$  in Space easy interaction, they are like a sure projection in the future of current states. Photon is the ***I am BEING***, like the current *true nature of Transformation*.

Finally, the Higgs Boson is somehow different from the others, as the *need for a proof* of current local Mass bending the Surface. It is the scale given by the *SpaceTime resistance* to which we measure *how much we are*. The Higgs Boson is the ***I HAVE***, as *tangible positive proof* of my current Persistence.

Starting from these elementary information messages and verbs, everything can be imagined.