Conjectures on SpaceTime

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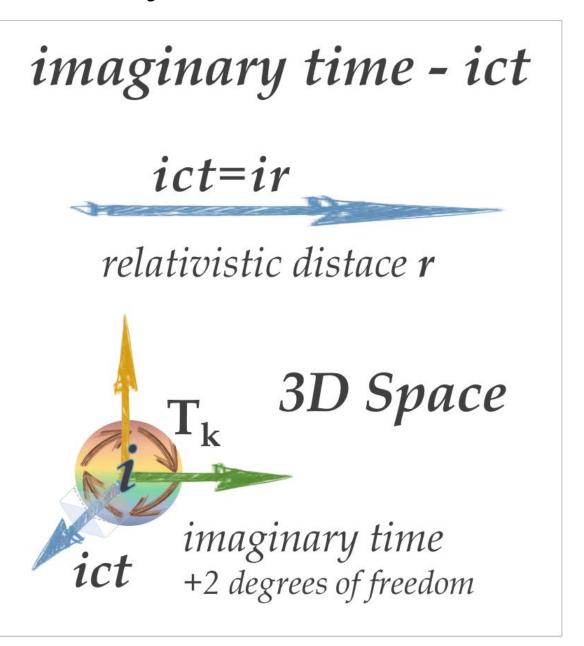
We haven't been able to create a **fair or happy world**, nor have we succeeded in living as a **sustainable human ecosystem**.
To face both problems it's time to look back to more **natural patterns** and search for a picture of SpaceTime that frames
Evolution with quantum and cosmological scale. To the root of the matter, the question eventually becomes:
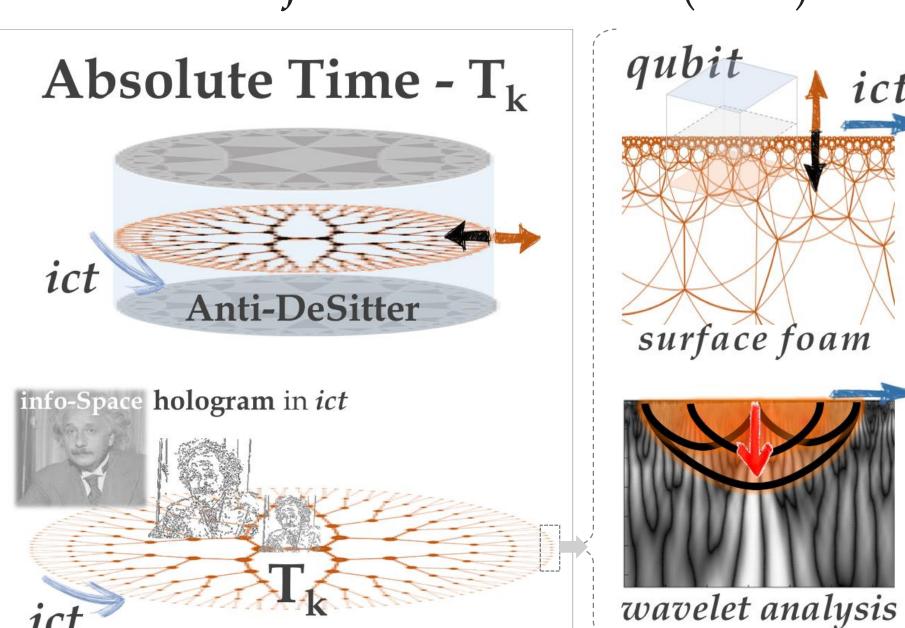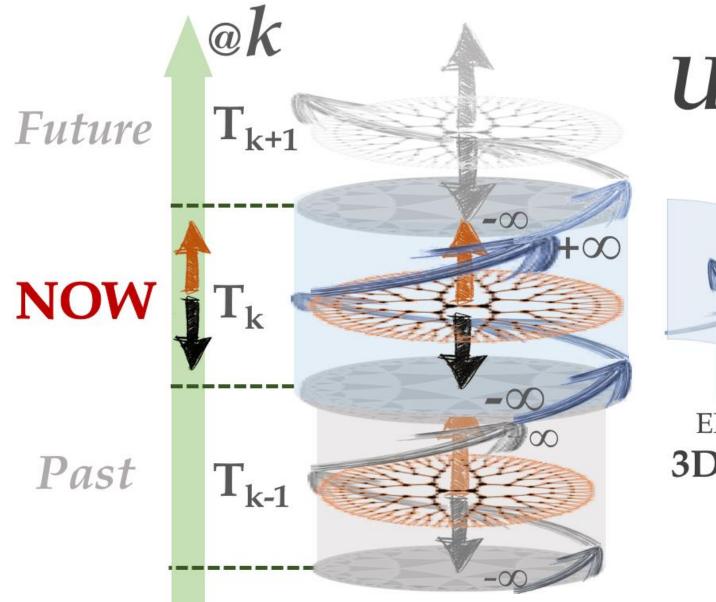**What is Time?** We need **a new perspective**!
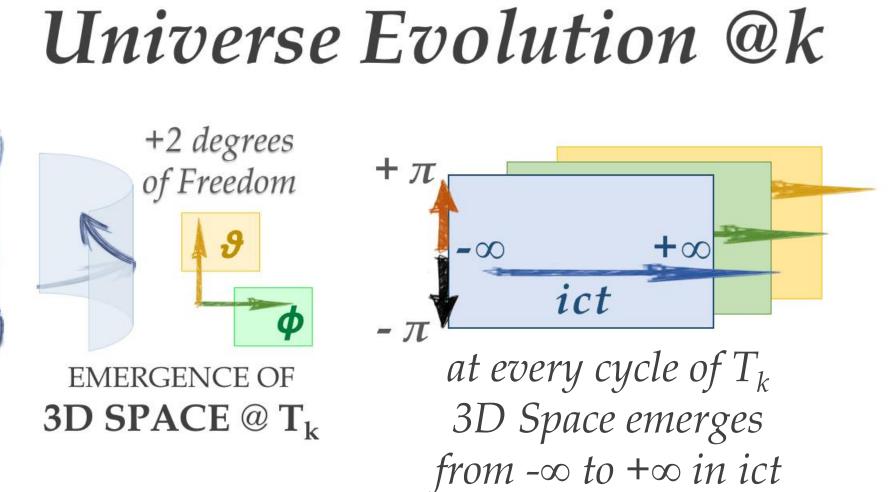
1: GEOMETRIES & VARIABLES

Relativistic distance *r* is equivalent to *imaginary coherent time ict* (*Hawking*).

Consider the *AdS/CFT Correspondence*, map *ict* to the surface and call **Absolute Time** (T_k) the additional dimension in the bulk, described as a local **discrete** 2π *reference clock,* a **neural network** and a **buffer** storing **entanglement information** of surface quanta (qubit saving correlation among distant points).

Exploiting the fractal self-similarities of natural phenomena, Absolute Time encodes the information living on the surface quantum foam through a **wavelet decomposition** along geodesics in the bulk, as **roots in Time.**

It is connected to the **Quantum Potential**, assures **persistence**, **memory** and **causality** and allows the *unbroken wholeness of the entire Universe* (*Bohm*).
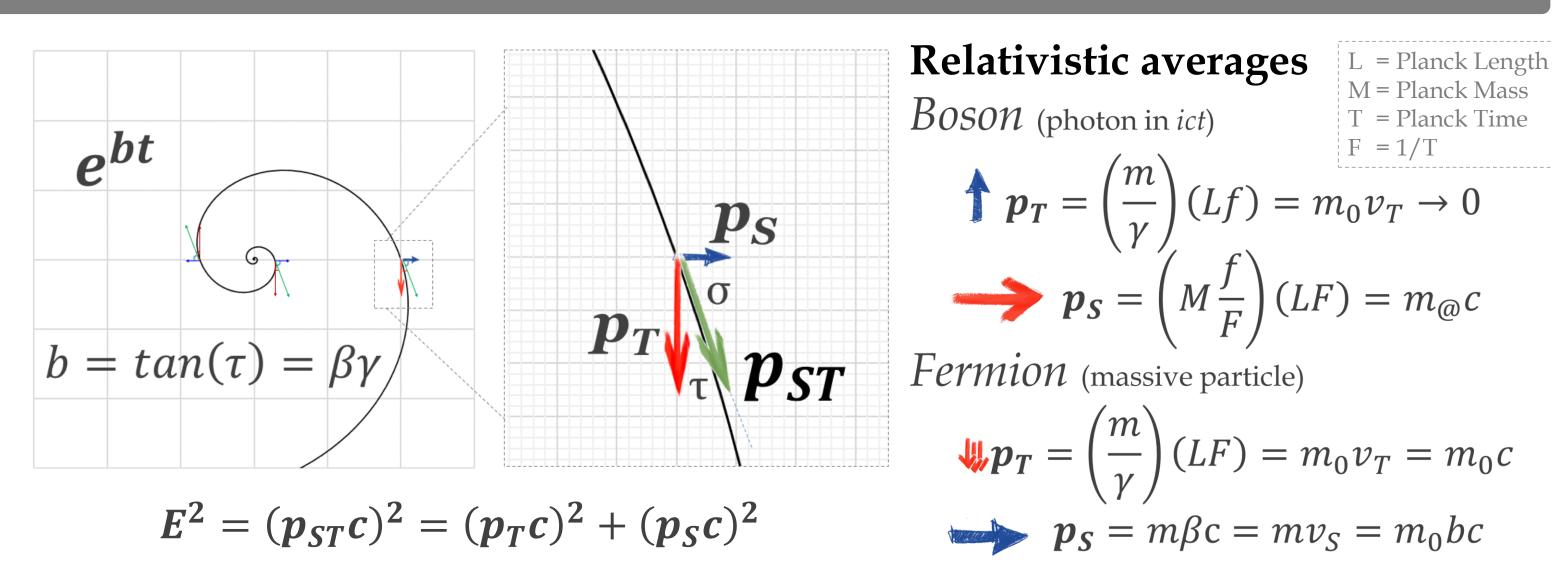
imaginary time - ict

$ict = ir$

relativistic distance r

3D Space

imaginary time
+2 degrees of freedom

Absolute Time - T_k

Anti-DeSitter

info-Space **hologram** in *ict*

qubit

surface foam

wavelet analysis

Universe Evolution @k

@k

Future T_{k+1}

NOW T_k

Past T_{k-1}

+2 degrees of Freedom

ϑ

ϕ

EMERGENCE OF **3D SPACE @ T_k**

$+\pi$

$-\pi$

ict

at every cycle of T_k 3D Space emerges from $-\infty$ to $+\infty$ in ict +2 degrees of Freedom

2: ENTITIES & MOMENTA

Bosons are **single qubit** and elementary **strings** pulsing coherently on the surface and leaving no trace in the bulk. Photons flow in *ict*, Gluons link together to persist at *c* in T_k.

BOSON

$L^2 + T$

NOW@k

$+\pi$

$-\pi$

$-T$

FERMION

$F = \frac{\hbar}{ML^2}$

$M = \frac{\hbar}{FL^2}$

Fermions are **networks of qubits** entangled through **roots in the bulk**. They pulse on a **common beat** (a **shared code** related to m_0 allowing self-decoding) and persist in the memory of SpaceTime keeping coherence in Absolute Time.

Time Momentum p_T accounts for the Bosons' wavelength and the rest-mass of Fermions, as the **Persistence** of the Entity in the pulses of the Absolute Time.
It describes the entanglement information of strings connecting distant points in *ict* that encode as a *coherent Self* in T_k. It shows, in the particle decoding through the pulsing roots along T_k, the *Energy distribution* and the rest mass *imaginary position*, that manifests *inertia* as resistance to additional info in *ict*. p_T defines, in its entropic distribution in *ict*, the *Quantum Potential* and the local curvature of SpaceTime (in the 3D space emerging in each current Now).

Space Momentum p_S sees a wave of **Transformation** on the Surface defined by *ict* and describes relativistic velocity and mass as info in *ict* phase space.
The combined momentum p_{ST} is equivalent to an Hamiltonian operator.

$$|\psi_E(x)|^2 = \wp(x) = \frac{1}{k}\sum_k |R_{k,ix}|^2$$

$$\psi_{E@k} = R_{k,ix}e^{-iS_k/\hbar} \quad |i\sqrt{m_o}\psi_E(x)|^2 c$$

$|R_{k,ix}|^2$

NOW@k

p_T

$ix = ir$

T_k
T_{k-1}

T_{k-n}

Entropic distribution in ict @k leads to Quantum Potential as a local tensor curving SpaceTime

3: DERIVATIONS & DEDUCTIONS

e^{bt}

$b = tan(\tau) = \beta\gamma$

p_S

p_T

σ

τ

p_{ST}

$$E^2 = (p_{ST}c)^2 = (p_Tc)^2 + (p_Sc)^2$$

Relativistic averages

L = Planck Length
M = Planck Mass
T = Planck Time
F = 1/T

Boson (photon in *ict*)

$$p_T = \left(\frac{m}{\gamma}\right)(Lf) = m_0v_T \to 0$$

$$p_S = \left(M\frac{f}{F}\right)(LF) = m_{@}c$$

Fermion (massive particle)

$$p_T = \left(\frac{m}{\gamma}\right)(LF) = m_0v_T = m_0c$$
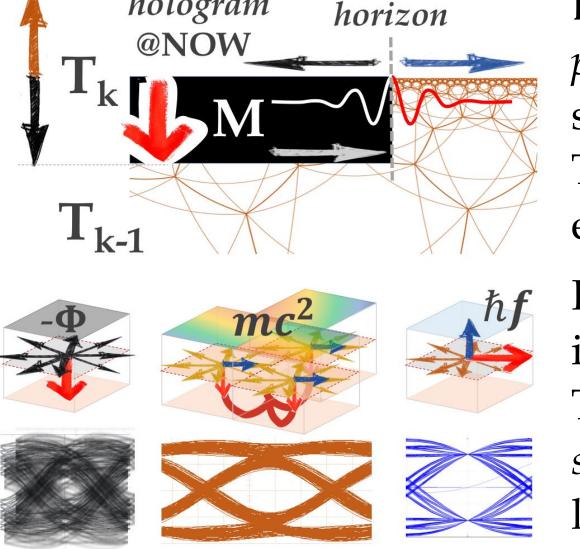
$$p_S = m\beta c = mv_S = m_0bc$$

From this perspective, **Gravity** is equivalent to the *combined angle of relative perception* in reference to the Planck scale for *Length in Space* and *Mass in Time.*

$ict = ir$

p_{Ta}

p_{Tb}

$$F_g = \frac{L}{M}\frac{p_{Ta}}{ict}\frac{p_{Tb}}{ict} = \frac{L}{M}\frac{m_ac}{ir}\frac{m_bc}{ir} = -G\frac{m_am_b}{r^2}$$

We can also map the *Dirac equation* to *Entropy*, as a *summary of the information* shown so far on the surface. It is calculated on the samples of the first order derivative of the wave-function on a log spiral.

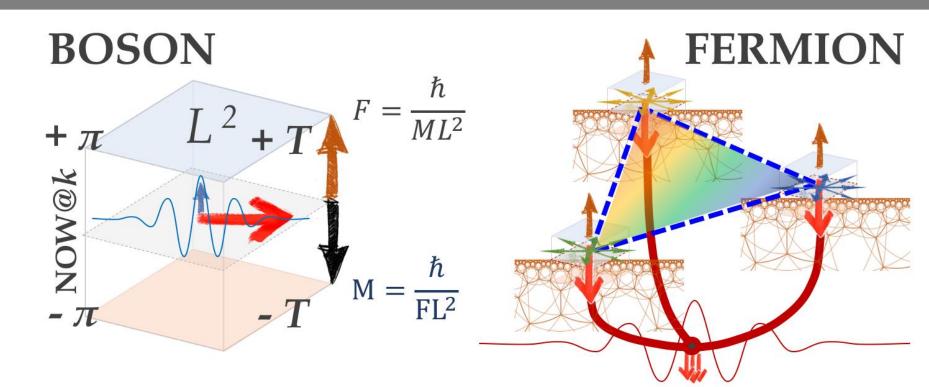$$-\sum_{k=1}^{T_E}\widehat{\frac{d\psi_E}{dk}}\bigg|k = \sum_{k=1}^{T_E}\chi_k\widetilde{i\chi_k} = h_\chi$$

$$\psi_{E@k} = e^{-iS_E(r_i)\frac{E_i}{E_0}}|k = e^{-i\chi_k}$$

hologram @NOW

horizon

T_k

M

T_{k-1}

$-\Phi$

mc^2

$\hbar f$

Black Holes are networks storing *maximum mass per minimum arc of distance* in *ict*. The max info stored in T_k leads to maximum surface curvature. The *optimal compression of info* makes them equivalent to a source with *max Shannon entropy.*

In the decoding of the local Space, their hologram is *1 tick away* from the surrounding *coherent Now*. The *ict* derivative on the horizon goes to ∞ as on a step, becoming too *out of phase* to be decoded, like in a decoder *eye-diagram on the wrong sync.*
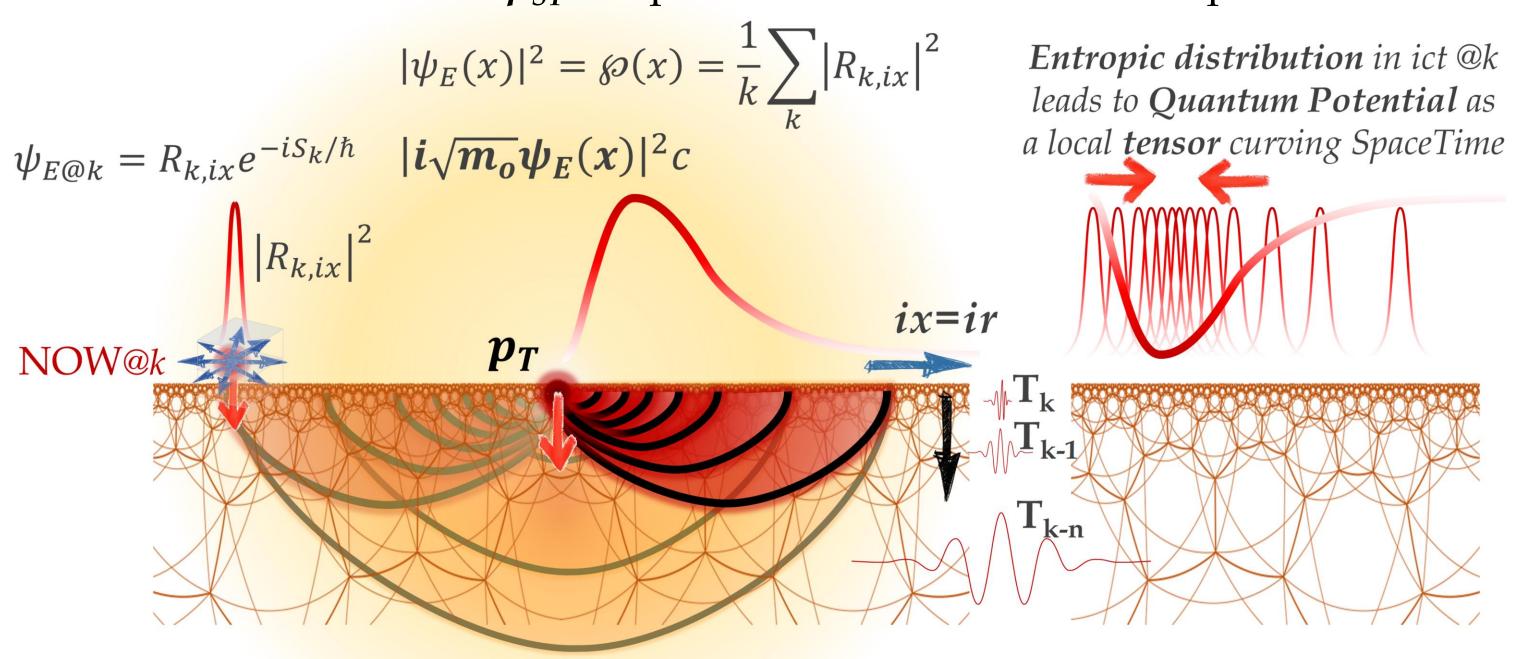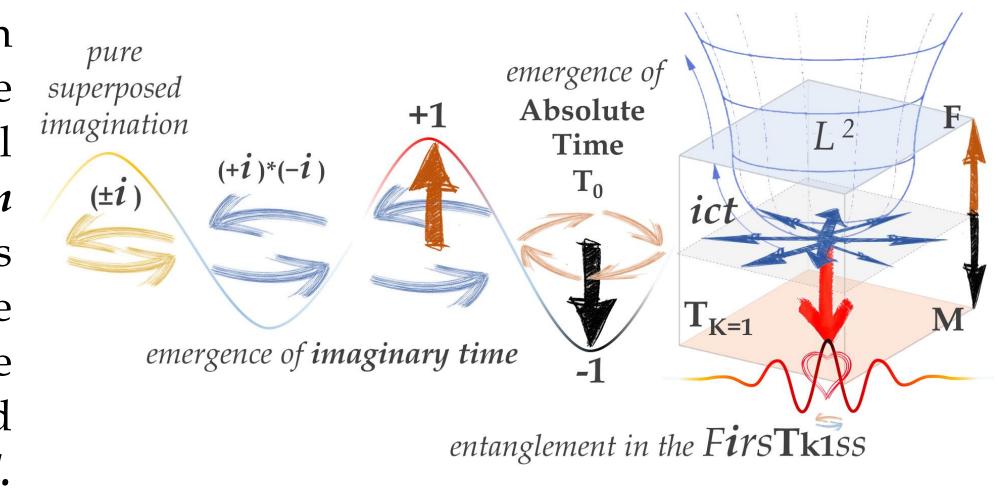
4: VISIONS & CONCLUSIONS

To picture the *Origin* from the proposed perspective we should rewind both times till *pure superposed imagination* and then see imaginary times developing towards opposite infinities, as if Absolute Time and *imaginary time* emerged from a **no-boundary model.**

pure superposed imagination

$(\pm i)$

$(+i)^*(-i)$

emergence of imaginary time

$+1$

-1

emergence of **Absolute Time** T_0

L^2

ict

F

M

$T_{K=1}$

entanglement in the FirsTk1ss

The entanglement of the 2 times in the **FirsTk1ss** allowed, in the new geometry, the emergence of 2 new degrees of freedom: a 3D Space in the first *Now@$T_{K=1}$*. It was the *bang* of the first pulsing qubit, vibrating string, reference code and eventually true *heart-beat* of our evolving and interconnected Universe.

Evolution follows the true desire for **transformation** of Entities and their wish for more **persistence**, assured in the Absolute Time entangled roots. From the *memory of the FirsTk1ss*, Entities evolve with new **degrees of Freedom** and the ability to entangle on a **shared code** in a greater being, in a **natural growth** of complexities, abstractions, efficiencies, new **emerging properties** and equilibriums, as experiences stored in the **memory of Absolute Time**, proving **causality** and **coherence** in a **connected Universe**.

Concluding, to assure a sustainable human ecosystem, collaboration is needed to develop the theory towards a deeper understanding of matter in SpaceTime and for the development of a safe *quantum energy distributed production*.

Eventually, as human beings, it is crucial as well to share the fundamental idea that *Time matters,* as the gravity of our choices. We should look for coherence and entanglement, for more complex *Self* and better *human-networks*, simply being inspired by Natural Evolution towards a true *Effective Altruism*...