

DELOCATION (NON-LOCALITY), IMMEDIACY (ACTION-AT-A-DISTANCE), PROCESSING TIME, AND SINGULARITY.

About an e-mail of 2018-08-23

Carles UDINA i COBO
cucobo@gmail.com

Abstract

Delocation ("non-locality")*, massless **Energy, Pre-material Quantum Information** with its **Processing**, and **Immediacy** ("action-at-a-distance")*, allow us to understand and characterize what preceded and originated our material Universe. Said Information is **manifested** in our Universe by **Processing Time**, Time that is **fully empirical** since it is represented by the LORENTZ Transformation (erroneously associated with supposed dilations-contractions). The current inconsistencies and limitations of physics are resolved with a **5-dimensional** geometry (three from Space, but **two from Time**). Said ignored quantum pre-material scenario, **continues to exist**, manifested by the **Singularities of what we call Black Holes**. Finally, the historic **Ether controversy is resolved**.

* Semantics is important due of the **interdependence between unconscious and language**. For what has been clarified here, the historical and centuries-old name of "action-at-a-distance" is **very unfortunate** ("Immediacy" is appropriate, since what is important is time, not distance, which also, as will be seen, does distances **not exist**), this is **what confuses the physicist**. Likewise "non-locality" (better "Delocation", because as will be seen, **there are no places or localities**).

THE NON-DISTANCE

In a space, a "metric" (or "distance between points"), is a correspondence that to any two points of said space to makes correspond some real number equal to or greater than zero (that is, zero or positive). Mathematically, we know innumerable metric spaces, and many more we can mentally imagine, but by just thinking about them, none of them we can transform into something real.

The mathematical concept of Metric Space and Metric was inspired by what most characterizes our environment, our Universe: the distances. The Universe is a **real** space in which we are used to establishing distances between any two places where we can go, even if there is eventually nothing. In a vacuum there are distances because nothing prevents it from being occupied, everything is referenced to other known or previously occupied points in space. That is, it is correctly assumed that matter can move throughout all space.

But if we extracted all its matter from the Universe (which is not the same as making a vacuum out in a container), there would be no interactions (**no** gravity, **no** light or heat,..., **nothing**) nor any reference (coordinates,...) ; there would be no real space, and so we couldn't talk about distance. That is to say, the existence of matter is an **unavoidable condition** for the existence of **real** distances (not exclusively mathematical calculations). That is, it is not about imagining a space without distances that only exists in our minds, but with an **existence by itself, intrinsic**. It is a surprising reflection, but totally correct.

So, if we are not creationists or anti-causal (because the opposite would be not being scientific but dogmatic or religious), and we consider the moment before the proposed Big bang from where our material Universe is said to have emerged (a moment before that, what is not spoken of), as matter does not yet exist, we could not establish distances. Everything that could precede said material state that characterizes the Universe would not have distances. It is as if before the material Universe (or at its beginning ...) everything had to be concentrated in a single point, although it is **not strictly correct** as we will see.

I insist, it is a new context, not raised, but necessary for what has been said. It is what had to exist before any hypothesis of materialization (Big bang or whatever). And like everything new, even if it initially seems strange or surprising, we must get used to it.

ENERGY WITHOUT MASS, BUT WITH INFORMATION

So, if we respect the necessary causality that science requires, the question is "materialization from what?" The answer is very easy, because we know the photon has no mass (and it won't be because of the many physicists obsessed with finding it), so **it could already exist BEFORE** materialization (or the Big Bang for those who prefer). Well, we already have an energy that does not require distances and therefore can be delocated if necessary. And before of the Universe.

Immediately a normal physicist will argue that the photon is a particle and therefore material. The fact that it is called a "particle" does not mean that it is, especially since it does not have mass, which is the **characteristic of all the matter**. So? I try to summarize what required a couple of pages in the references at the end ("Quantum Information ..., Vs. Relativistic Dilatation: ...") that the reader can access. The photon has a "double life", and the one that physics treats is **only** its "second life", precisely when it disappears/ dies when interacting and what we see is its **burial**, not the photon. Then, and not before during his very long strict life, is when we can say that it sometimes behaved like a particle (which is very different from strictly having been a particle). It is justly like that of the famous box with the "cat". As a "living" photon, it is **never** seen, its trajectory can only be deduced when it has already been buried (HEISENBERG), and in experiments it is sometimes difficult to know where it has passed. A ray of light can be seen, of course, but what we see are the photons that the ray of light loses when passing through material media, which is what we see because they disappear with their interaction. This is why the Universe, which is full of photons everywhere, is dark (apart from seeing those that come to us from the stars and die, either in the atmosphere, in our eyes, or in optical telescopes, that is, we always see only his burial).

The "double slot" experiment (YOUNG) and the even more complex ones by ZEILINGER ("Entanglement swapping"), or by KAISER, ..., JACQUES, ..., make it clear that photons:

- 1) "they can behave like particles", which is very different from being strictly particles; very briefly and without going into the important association "virtual \leftrightarrow versatile", it simply happens that their virtuality allows them the versatility of being able to be like "jokers", and that in the material Universe they can "behave like" any material particle (because in addition, the photon is what has generated them);
- 2) photons (as something "alive" in their strict existence, in their "first life") are not seen, in experiments they are only always referred to moments already in the past, from which their behaviour (trajectory,...) is deduced.

Regardless of extrinsic versatile appearances, the so-called Polaritons verify the immaterial and non-mass nature of photons, by being immediately stopped from speed "c" to zero, and subsequently accelerated from zero to "c" again immediately, which despite their infinite decelerations, they do not involve energy exchange, which in both cases should tend to infinity if mass existed. As will be seen, two more singularities.

PREMATERIAL QUANTUM INFORMATION

In addition to energy (photons), could there have been anything else before the material Universe (14 billion years ago)? Well, there could also be information, because information **is virtual, it is not real, it is not material**. It is the "Underlying, pre-material, or quantum Information", or whatever you want to call it

Let us think that electromagnetic radiation **has no mass** (they are the same photons), nor does it imply transfer of any matter, and we know that they are an excellent support for the transmission of information, so nothing prevents the existence of underlying Information in this scenario prior to the materialization, without matter and even less without masses. It is clear that because it is **virtual**, the information is completely independent of the existence of matter or mass. It belongs to another totally different domain, but it exists without a doubt, only, I insist, it is not real-material. Nothing allows us to doubt its anteriority to the apparition of the matter. All of this is independent of the fact that in material settings the transmitted information can also be supported by material elements (genetics, hormones,...) thanks to the versatility that its virtuality confers on it (it behaves "like" matter, although it is not).

Today, SZILÁRD's doctoral thesis, from 1922, **relating entropy and information** in order to resolve the inconsistency of the "MAXWELL Demon" of 1867, is still ignored.

But also, even already in the material scenario of the Universe, we have since 1923 the well-known "wave-particle duality" (BROGLIE) of unquestionably material physical Particles with mass (protons, electrons,...), which has generated the photon, which further reinforces all of the above given that the "wave" of material particles even refers us to the underlying quantum information, something today unquestionable by Quantum Computing. Material particles cannot hide their informational legacy, and, curiously, their characteristic mass, physicists prefer to measure with units of energy. Information and energy look where you look.

In 1930 the Entanglement was already raised, something that EINSTEIN considered "terrifying", for which reason, together with PODOLSKY and ROSEN, he established the "EPR Paradox" (1935) to ignore its consequences. BOHR, for example, already questioned the EPR argument back then. BELL's Theorem (John Stewart) was not until 1964 (and as his name indicates it was in the theoretical realm). With him the EPR Paradox was proved wrong. The theorem required a "subquantum level", that is, information, but that too has been ignored.

The empirical verification of the correctness of the BELL Theorem would come from 1972 with the experiments of CLAUSER and his subsequent improvements already mentioned by ASPECT and ZEILINGER, up to distances of hundreds of kilometers. The Entanglement forces us to consider **information as an intrinsic component of physics**, but it was not until last year 2022 that the three scientists received the Nobel Prize in Physics, 50 years after the unquestionable experiments.

WHEELER contributed to the earlier Entanglement experiments. In "It from Bit" (1989) he advocated the principle that "**Information is the basis of Physics**", but mistakenly thought that it would be resolved by reformulating physics in terms of bits. DIRAC already said it: "Renormalizations are a mathematical make-up, nothing to do with physical reality." It is not about making up or beautify what is wrong, but looking for the correct paradigm.

Authors such as B. R. FRIEDEN have associated the photon with self-intrinsic information.

Not even with Quantum Computing based on things as minuscule as physical particles has this serious ignorance been raised. For this reason I always say that physicists implicitly presuppose a capricious and pre-scientific God who put these impressive calculation capacities in the Particles so that for 14,000 million years they would be absolutely useless, until that men ("made in his image and likeness"), discovered them and could start playing and entertaining with it.

And finally, regarding the "quarks", it is said that compose some of the physical particles, the so-called hadrons (protons, neutrons,..., pions...), but "they are not confinable", a magical play on words not to say that they have not been able to be detected as matter despite the many years that they have been tried (today they are not even tried anymore, it is accepted *sotto voce* that they are not "confinable", that is, that they are not matter). That is, they are not perceptible realities, so it is an **unreal** (non-real) hypothesis, so their existence can only be justified if it is something virtual, that is, it must necessarily be information. They are

empirical "reflections" of the underlying Information, not strict matter. In the "STÜCKELBERG Diagrams" (misnamed "FEYNMAN Diagrams") the speed of light is not "violated" because, as will be seen, the **Immediacy** ("action-at-a-distance") of the underlying Information must be considered. "Quantum **Chromo** Dynamics" (QCD) begins by being assigned a metaphorical name inappropriate for a science, and with mystical features (charm, colors, smell, taste,...). And when the atoms are explained with only 3 Particles, the QCD requires in the words of G. SARDIN: "a total of 44 primordial units: 36 quarks and 8 gluons, ... leaving the other particles without structure or with an indefinite structure, as is the case of leptons (electron,...) and bosons,... QCD theorists have made the magical achievement of **making real the unreal.**"

Given that in our non-physical domain we have innumerable symbolic information systems that **are not directly with material support**, such as the psyche, languages, computer software (which allows the automation of any process), if we do not fall into creationism, said ancestral information without material support already had to exist before, **necessarily**. And precisely the psyche, languages, computer software,... may exist because they are **heirs** to it, but this is another matter (see <https://www.sistemaconceptual.org/>).

Can we speak of "distance" in a stimulus, in a desire, or in knowledge? Of course not, but it is undeniable that they exist, they are information and therefore virtual, not necessarily "localized". I am not saying anything new: "*Knowledge does not take up space*".

Today physics confuses what was transparent just over a century ago. It confuses the real (matter, the tangible) with the virtual (either the information [optical images included], or the mathematical model of representation). Furthermore, the differentiating characteristics of the matter, such as its tangibility and effective occupation of volume, are only manifested from the molecular level ("the electron does not vibrate, the electron is the vibration", "atoms are empty",...).

Is something else needed? No! Well, it must be insisted that with information and energy (and **without distance**), we can do anything! For example, it was possible to make the material Universe and its derived distances (or to continue making more of the Universe even today).

DELOCATION ("NON-LOCALITY")

What is "Delocation"? well, is the result of said state of non-distance, due to the non-existence of matter. It is not a question of "being anywhere", or of being non-localized (which is a negative interpretation) but of not depending on the distance of a metric space. It is not a "0" value, there is **no possible value**.

So we can suggest the existence of this "pre-Universe" of information and energy, but without matter. That is to say, that it exists as information and photons, but without being real-material. And I insist, since there is no matter, there is **no distance or displacement**. Everything is "together", but "together" from our Ptolemaic material perspective. It is not that everything is together, it is that the concept "separated" cannot be applied nor the concept "together" that implies distances, since these do not exist. So there is **no displacement speed either**, nor does it need to be. Nor do the derived **accelerations** exist (as in the case of the Polariton already seen). In this context, **Immediacy** ("action-at-a-distance") is added to delocation ("non-locality").

In said prematerial quantum "**scenario**" there are **only two dimensions**: Information and Energy, so talking about anything related to the dimensions of Space or Time **is**

wrong, it should not be done, as they are exclusive characteristics of the Universe scenario. One cannot even speak of "Processing Time", neither of "Infinite Time", nor of an "Arrow of Time". Neither strictly from "quantum space" or "abstract mathematical space", because it can be confusing, the Quantum does not have "space". This is another world, yes, and very very different...

SINGULARITY

Said necessary pre-Universe, does it still exist? Well yes, yes it exists. In addition to having existed, it continues to exist today. For example, the so called Black Holes prove it.

That a black hole implies a singularity is strictly not a discovery as has been valued until today, quite the contrary, it is a denial. That is, it implies that the known laws of physics are no longer valid, since absurd values appear (infinite,...). Strictly, **a singularity in physics is a failure**, a limit to the knowledge reached by physics. Having clarified this, it must be said that to advance, science also needs at least those failures, that is, to know what it is not, because from here the research and its hypotheses are delimited/restricted, to find out in the right direction what must be true.

Why do singularities appear in physics? Well, because the current laws of physics are restricted to the material, they do not consider an information scenario, like the underlying or pre-material information already mentioned. And when it manifests itself to us directly or indirectly, the current laws of physics are useless by not contemplating it. Consequently, we should look for some theoretical explanation totally different from the current one. But this reflection is not made by science. Rather the opposite: everything is triumphalism.

And the positive thing that should be considered in said failure is precisely that said failure demonstrates the need for a non-material and in turn delocalized state. Black holes are like a "curtain" that separates the material scenario of the Universe, that is, what we see and could "touch", from a different scenario, prior to when the Universe appeared, scenario that the Black Hole allows us only to deduce unequivocally. And also, that then (14 billion years ago) not everything was transformed in our Universe, as evidenced by the current permanence of Black Holes.

It is evident, common sense, unquestionable (another thing is to be willing to accept it, or want to understand it) that, epistemologically, the very concept of the Big Bang is absurd. First, because of its creationist and non-causal formulation, disregarding the "before". Second, due to the aforementioned existence of black holes and their nature. And more reasons that are exposed in the aforementioned "References". And apart also, due to the absence of mass in the photon, the Entanglement, the Quantum Computing, and others, which require the existence of said non-material scenario of delocalization and underlying information.

What is surprising is not this, but the Mainstream's reiteration of denying the existence of a pre-material scenario, and of not trying to incorporate said scenario into traditional material physics.

If it seems strange, it is only because of our mistaken perspective: looking at the Earth from Egocentrism, looking at the Universe from Ptolemyism. As equally erroneous is to look only from a real-material perspective at everything that can exist. I insist, "exist" correctly defined, includes both the material (such as the Universe), but also the virtual

(such as the underlying Information). An analogous error in the Science of knowledge, by confusing the psyche with the material brain (strictly the entire nervous system) through which its information circulates.

This is the "delocation". It is not to consider things only in our material Universe, but also to consider their previous virtual, non-material ancestor. It is not about "parallel universes" or "multiverse" (speculations that have led to nothing) but rather a scenario prior to materialization that still exists. For this reason, one can speak of "**on the other side of the scenario curtain**", where in the manner of a "theatrical prompter", the "underlying information" gives instructions to the material Universe. That is, the control action of the intrinsic laws of physics. Some intrinsic laws that science tries to represent and approximate with our laws based on mathematical knowledge. But they fail when they try to represent the non-material, for not being foreseen.

The pre-material/ quantum Information exists in the aforementioned non-material scenario of delocalization prior to the Universe, so its "transmission" is **immediate**. Said from our material perspective, it seems to us **at infinite speed** (but this is an incorrect interpretation, since from what has been said, there is no speed because there are no distances). This is the case of the Entanglement, whose information is transmitted "through the other side of the curtain" (and therefore, **delocalized and immediately**). On the contrary, Electromagnetic Radiation (ER), although it has no mass and can support information as the underlying Information, it has **limited** speed "c" because it in turn is a carrier of energy through the Universe, outside the quantum scenario, and this implies processing Time to calculate its trajectory by its interactions with matter.

If physics is not added, correctly, empirically, the underlying quantum information, pre-material, pre-BigBang, or whatever you want to call it, you cannot continue to do non-Newtonian physics (that is, relativistic physics), unless we get out of science and into metaphysics, theology or science fiction. Whether physicists accept it or not, is another problem.

EMPIRICAL INFORMATION

The question is how to incorporate such underlying information into our material empirical equations/ statements? Well, accepting the absurdity of the centuries-old hypothesis of the "dilation (of the unit) of time" and substituting it for the intervention of the "Processing Time" due to said processing of the "Underlying Information", on the other hand necessary for the control of the basic dynamics of matter.

The empirical and unquestionable "LORENTZ transformation" is not explained by means of a "dilation" (because it gives rise to inconsistencies, contradictions and paradoxes), but rather clearly reveals the existence of a different time, not material, which affects matter ("hibernating"/ "freezing"/ "hypnotizing" its dynamics as matter, when it overlaps). A time not directly detectable by material clocks (because of their different nature and, as just said, because it they "freeze"/ "hibernate"/ "hypnotize") **that is added to material time**, and which is deduced **only** by comparing times of systems at very different speeds. A time that manifests a more or less long causal information processing, depending on the relative speed between the systems (in the same material time, **more** "controls" and **more** "processing time" are required, due to the **greater** distance travelled, due to the **greater** speed of the system), something that is most reasonable and common sense, quite the opposite of the incomprehensible implications of "dilation".

But it is difficult for the scientific community to accept an error that is more a hundred years old. And/or it is rejected due to the simple laziness of having to reintegrate so many physics equations, given that in all the equations, the omnipresent "dt" should break down into:

$$dt = d(t_m + t_p) \text{ (with } t_m \text{ fixed and } t_p \text{ variable)}$$

Finally, instead of the insufficient and controversial 4-dimensional "Space-time", a **necessary fifth dimension** (second temporal, separately from the "t_m" dimension) associated with the "t_p" variable must be accepted, which allows empirically **incorporating** said underlying information, **combining** it with the 4 traditional material dimensions.

This would, in turn, avoid wasting time on erroneous hypotheses of arbitrary and even infinite dimensions (the "strings" hypothesis, etc.), or other exotic proposals.

Just **one more dimension to add** to the 4 traditional ones, which because it is **virtual** in nature (and therefore **versatile**) is enough (no more dimensions are needed) **to solve all the problems posed by physics**. And above all, where is the supposed 95% of our Universe? Or also how to solve the immense "Catastrophe of the vacuum"?

ETHER

Finally, another **historical controversy is also resolved**, such as the existence, or not, of an ether. As it happens with the "Quarks", it is **not** real-material, **nor** is it detectable (the sought-after "wind of the ether"), but it **exists** (affirmative), only that it is virtual-informational, it **is precisely the underlying quantum Information, delocalized and immediate**.

REFERENCES

- [1] Carles UDINA i COBO. "Deslocalización, Tiempo de procesamiento, y Singularidad" (Spanish-Castilian, 7 pages):
<https://www.sistemaconceptual.org/pdf/InformacionDeslocalizacionSingularidad.pdf>
- [2] Carles UDINA i COBO. "Quantum Information Processing Time Vs. Relativistic Dilatation: a necessary Change" (English, 18 pages in pre-print):
- [3] Carles UDINA i COBO. "Información o Dilatación" (Spanish-Castilian, 18 pages):
<https://www.sistemaconceptual.org/pdf/InformacionODilatacion.pdf>
- [4] Carles UDINA i COBO. "Quantum Information Vs. Relativistic Dilatation: a Summary" (5 pages in pre-print)
- [5] Carles UDINA i COBO. "Información o Dilatación (Resumen)" (Spanish-Castilian, 5 pages):
<https://www.sistemaconceptual.org/pdf/ResumenInformacionODilatacion.pdf>
pages)
- [6] Carles UDINA i COBO. "Universal Science: Information transfers processes" (English, 6 pages in pre-print):
- [7] Carles UDINA i COBO. "Mathesis universalis y Tiempo" (Spanish-Castilian, 6 pages):
<https://www.sistemaconceptual.org/pdf/MathesisCAS.pdf>