The Foundational Questions Institute essay (feb. 2011) : ***Is Reality Digital or Analog?***

A beautiful theory of Everything: how simplexity leads to reality!

(*Mahamba/Mathematical Information Theory – **MIT*** ®)

Author Bio

Born in Kinshasa (Congo), after a diploma in Computer sciences (University of Paris V) and I post-graduated in Management & Information Systems from Telecom Paristech and Essec Business School in France. Now as a senior manager consultant, I help my clients (finance, consumer products, telecoms, NGOs…) to improve their corporate performance focus on their business intelligence priorities (to accomplish their goals with confidence and satisfaction by using key indicators). As a life-style choice, I spend my free time on personal researches (strategic-innovation) and advance education. Also, I like participating in workshops to facilitate feedback sessions with students (entrepreneurship spirit, leadership and consulting experiences).

Abstract

The quest to explain the true nature of reality is one of the great scientific goals. In fact, this essay contest asks: is Nature fundamentally continuous or discrete and how can these two different but very useful concepts be fully reconciled? Physical science is vast, complex and remains mysterious [10]. Since long ago, the great thinkers and scholars have dedicated their lives to the attempted comprehension[1] of this reality that has become so abstract. Throughout the centuries and through experimentation, they have established numerous laws, concepts, theories, and principles concerning the fundamental notions of reality (centered on matter-energy and spacetime). I propose a central theory (MIT), based on the information of, and compatible with, the contemporary scientific knowledge; the existing fundamental relation between the "*physical entities*" passes through the determined quantitative transmission (quantity) of this preserved transcendent greatness (quality). In addition to a "*formal*" relationship (existence) which creates an informal description of what is real, there is a causal relationship between "*phenomena*" (relativity). My informational approach has been productive in several domains where many enigma persist; solutions for these problems must be envisaged globally, using ideas and concepts from numerous different fields, with a coherent schema...
The "*Theory of Universal Relativity*" (TUR as a ToE) proposed here lays bridges between domains which, at first glance, have nothing to do with each other; it also provides insight into how we can improve our knowledge by understanding the interplay of complexity and simplicity. Therefore emerging from simplexity (contraction of simplicity and complexity), reality is both digital and analogue (and between) and also more! We know there is a strange and mysterious world that surrounds us, a world largely hidden from our senses with extra dimensions and as a mathematical concept of reality, MIT may confirm that we are part of a cosmic hologram (a paradigm shift). My theory has the advantage of being extremely simple, not limited to scientists because everyone can understand it (**I = 1 ± i**). So, in this essay, I will try to explain why and how [1][13][48][51].

"Behind it all is surely an idea so simple, so beautiful, that when we grasp it - in a decade, a century, or a millennium - we will all say to each other, how could it have been otherwise? How could we have been so stupid?"
John Archibald Wheeler

[1] "*Truth belongs to those who seek it, and not to those who claim to hold it*" Marquis de Condorcet.

Presentation: *"We use logic to prove things and intuition to find things" Poincaré*

First, thank you *FQXi* for giving me the opportunity to express myself in front of this exceptional forum, one hundred years after the inauguration of the famous Solvay conferences. Since I don't come from the academic world of physics, the inherent questions "*from where you speak?*" and "*what is your status?*" intimidations come to mind. Very often, this question dramatically reduces down the topic to the pedigree of the one who is presenting it. So, this characterization of the speech[1] evacuates its critical and rational examination, from the perspective of truth of its statements. This being said, this represents for me the satisfaction of being able to present the results of my work to a knowledgeable community (an elite without elitism, that's very encouraging and auspicious), so that, I hope, we can live a moment of exaltation. To do this, I built this text with the firm commitment that it will be touching as well as convincing... Hopefully, if I win a prize in this contest, I will then gladly apply it to the benefit of the AIMS[2] (*African Institute for Mathematical Sciences*) headed by N. Turok for its invaluable initiative[3] "*Next Einstein*" for developing Africa by fighting fatalism with brains [44]; I will be honored and proud to contribute to it.

Since I was a little boy in Congo, my motivation was to understand how Nature works[4]. Even today, I am willing to think about everything, which is why I make surprising discoveries. I had been reading lots of manuals in my spare time, trying to capture the essence of many of the greatest minds throughout history. My reflections presented here required a situational intelligence[5] and an organizational ability. Despite a relative ignorance[6], being self-educated[7] means being free to understand at ones own pace, but above all live the serendipity... It allowed me to learn in another way, by myself, without a teacher or professor. In fact, learning[8] means adapting to new situations in order to get closer to the objective that we seek. So for me and for some scientists like M. Tegmark (*the Ultimate Ensemble*), reality is (or at least had been) a mathematical structure. This idea pushes physics into the realm of philosophy [3][20]. If Kant's transcendental illusion of choice is to pretend holding the "*thing inside oneself*", where we can only know "*phenomena*", for Granger [16], it consists of the desire to capture a reality inside oneself, apart from any symbolism. Therefore "*what is reality?*" [40][42][45][46][69].

Physics tries to understand the Laws of Nature [3][10]; for that it imagines the models to construct representations that are sometimes grandiose in order to illustrate reality. This quest however, as it brings us closer to the ultimate objective, seems to be unreachable. Thus, despite my "*technical*" shortcomings, I was confident[9]... My enthusiasm has no intention to discredit the academic experts[10] who devote their lives to research, my primary objective was to make the simple observation[11] of the absence of a clear and comprehensive definition of the information concept [15][61]. However, I express my real appreciation to the professionals of scientific research, because without their publications, I would not be able to gather much information, nor capitalize on the knowledge necessary for my quest... A. Jacquard said "*my personal experience as well as my experience as a teacher makes me question the value of understanding quickly. Understanding means creating in oneself a mental structure; it can only be a long construction.*" [43]. There are people who discover something unexpected or see things in a new way, things even appertaining to science. Such cases are exceptionally rare, but they naturally exist [18]. MIT aims at unifying everything in the reality, so whenever possible, I tried to find an explanation consistent with the laws already discovered. Some theories being tested explain many facts, but none have been developed that are quite general and compatible enough with all those already established... By evidence, Strings theory was on the right track; "*Strings*" are intimately tied to understanding the universe we see around us. But now we need a famous equation for Information theory, which is what I propose to offer. Thus, Smolin [2] usefully calls for a true unified theory in which he sets out three key objectives: explain the experimental data that other theories do not understand, but mainly make predictions that can be validated or refuted, or even allow consideration of new kinds of experiences; be based on intellectual principles for action in the understanding of the laws of physics and unification, and finally obey the fundamental independence criteria, which goes back to Leibniz and his theory of space as a system of relations between "*beings*" and which general relativity (GR) also performs. In his perspective, E. Morin considers that "*all knowledge must lead to mystery, its starts from astonishment to reach bewilderment*", then, as astounding or magical that MIT may seem[12], I am convinced that it is able to meet these wise criteria by offering to produce a great intellectual revolution. Indeed, MIT announces conceptual and philosophical changes, within a "*mathesis universalis*[13]" vision, consisting of a unification of science and philosophy[14].

First we must distinguish between "*Real*" and "*Reality*" in the phenomena of Nature; are we only connected with Reality (Bohm's consciousness)? Then when, how and by whom is it fabricated? It is not simply an image juxtaposing mental maps and imaginary lands organizing itself into levels. So where is the truth? Truth[15] is not a sensitive, observable and measurable object. Only analytical thinking can allow us a better approach [40][45]. Even as he strives to faithfully reproduce with fidelity, what is real however is not necessarily Real [42][46]. As a central concern of the philosophical domain, truth, always sought, is neither a fact nor a given. According to Russell [65], nobody has ever gone as far as defining truth as that which is known; and thus far the epistemological definition of truth is what can be known. So can we definitively establish the scientific concept of information[16] [65]? My initial premise was to develop the most elegant formulas that describe it. Then, concretely, what is information naming?

And what is information and how do we measure it [5][24][25]? Generally many people often misunderstand this "simple" concept [14][21][46]. A significant error is to forget how much information depends on its context[17], and therefore its shape may vary. The information is probably both the simplest concept to grasp and the most difficult to define [55]. The basic idea is that information is something that reduces uncertainty. However, any element, event or phenomenon, regardless of the scale being considered, spontaneously and foremost generates information. Revealing several meanings, it is nevertheless identified in physics for regulations[18] description. Yet for nearly a century, uncertainty is included in the very nature of the nondeterministic world (Heisenberg). Since the reasoning of uncertainty is based on the qualitative and non quantified, it results directly in the following questions: is our physical world discrete or continuous? How does science represent reality [35][46]? The answers are not obvious. But quantum physics[19] also found that particles (discrete) and waves (continuous) are just two aspects of the same reality, which does not help to simplify things... This finding raises questions; but the essential work was to examine the evidence. In this perspective, we go through a change of representation: formulate a comprehensive theory based on a small number of parameters interconnected together in one system of simple equations, and which would allow defining (and predict) the set of physical phenomena (in a single mathematical underlying framework). So if this ultimate and famous equation exists, it simply explains all physical phenomena, despite the complexity of the universe! Below, I propose to track this elegant universal harmony. In an extraordinary journey that will take us to unexplored paths and harmoniously reconcile the scientific references that are the principle of Mach, Maupertuis, Boltzmann, Einstein's relativities, the De Broglie and Schrödinger waves, the Planck and Dirac quantization, the Shannon entropy (Nash and Perelman), the Hawking and Penrose imaginary times... This also involves creating a consistency between certain ideas such as levels of reality (Heisenberg, Nicolescu), the Lupasco's Included Third parties [6], the B. d'Espagnat "*veiled real*", the complex (Charon) and scale (Nottale) relativities.

The scientific community has had several great epochs of thought. And in recent years, but still not a majority, it is considered that everything is information [7][22][50][69]. In its modern version, the information resulted from "*Macy conferences*" in the fifties; these first multidisciplinary conferences gave birth to cybernetics and communication theory (Shannon, Weaver) that would upset most sciences, from biology to psychiatry through cosmology. The challenge is to distinguish the communication from the information itself [5]. The two concepts are intertwined, inseparable, because on one part what pertains to the analogue continuous flow (Wiener), and on the other part what pertains to discrete digital information [24]. Like Dretske, I argue that nature contains "*objective*" information [14], that is to say, regular relations between phenomena whose existence is not based on the presence of an observer... In fact, the real question is whether there is an exact theory that is the reflection of reality[20]. In fact, I discovered[21] unheard of and absolutely unexpected correlations in physical mathematics, suggesting the origin of what is[22]… A scientific concept represents a reality[23] insofar as it connotes not only a current state but an unrealized state (virtuality), which however is part of the reality represented. Any event, any interaction creates information since it is a change in shape! From my point of view, entropy is neither information nor its opposite[24]! In 1997, J. Maldacena formulated an exciting idea on gravitation [8]; so logically [42], we are part of a complex evolutionary process, a dynamic self-organization based on information, which since the original Big Bang gave birth to an incredible diversity of forms and lives[25]. The information comes in two sides: as the information process as such (dynamic) and as a result of the reconfiguration process (static), in coherence with basic mechanisms which govern the construction of the world [1][3][48][63]: quantum mechanics (QM) (Schrödinger, Dirac, Feynman, Everett...), theory of computability (Turing, Gödel, Chaitin...), separation between science and metaphysics (Descartes, Popper...). The physical concept of information is therefore not a simple avatar of the multi-figured energy; quite the contrary, it is its "*genesis*". C. Fleury wrote [52]: "*the imaginative faculty has on the contrary a real role in the pursuit of truth, allowing man to reach large parts of reality [...]*". So the information is essential in the universe, some physicists think it is information [22]. This is where we find cybernetics and transhumanism[26] for which life is information [40][50]. My original approach will allow to deepen our understanding of the merged concepts of spacetime, matter-energy and force-fields, while preserving the gains of the current fundamental theories. In designing a mesh of "*discontinuous elements*" (*Connes'* non-commutative structure) emerging spontaneously and presenting a realization of the QG, with which we should understand the real structure of spacetime linked to material-energy. Yet my wording may be neither a perfect description of the universe nor an exhaustive explanation of all phenomena, but it is a nice way of understanding the world[27]. In the end we see that the genesis of new ideas [47] is just as much the evidence as the paradox.

Formulation: *"I am among those who think that science is very beautiful". M. Curie*

Scientific representation often utilises images to support and aid to think of objects, but it builds models of them not in the form of images. A scientific concept[28] represents a reality insofar as it includes the idea, not only of a present state, but also of a state not yet achieved which, however, is part of the reality to be represented. The two current theories (Shannon/Weaver, Kolmogorov) are linked to each other (Brillouin), and they have their limitations, the one as much as the other. It becomes necessary to find a better one. In order to do this, my MIT confirms some intuitions while still remaining compatible with the two preceding ones. It is well known that the concept of information is difficult to pinpoint, especially in physics, despite the often evoked links with thermodynamics through entropy (Clausius, Carnot, Boltzmann, Shannon, Bennett, Zurek), assimilated to the quantity of information contained in a source. In order to count and quantify, it is necessary to utilise abstraction. For its mathematical beauty, Euler's identity is considered by many to be the greatest equation ever [4]. The identity ($e^{i.\pi} + 1 = 0$) links five fundamental mathematical constants[29]; based on, my MIT formulation is built of three complementary numbers having the most unusual properties: Chaitin's constant[30] (Ω) [32], and the golden ratio[31] ϕ (and its reciprocal is φ). Having become legendary, the most fleeting and emblematic physical quantity not yet described must have an elegant formulation leading to a mathematical magnificence. In fact, the set of three equations proposed here indicates that the propagation of the wave in spacetime is valid only for one entity at a time (when Ω=½). In an interaction that propagates in an abstract 6-dimensional space, (through the "5+1" exponent numbers), the information characterising all infinitesimal changes, it constitutes each portion of reality with which all is related, from which, therefore, spacetime can emerge. The key idea is to consider information as an infinitesimal unitary transformation [51]: $\hat{\mathbf{S}} = \mathbf{1} + \mathbf{i}.\boldsymbol{\varepsilon}.\hat{\mathbf{Z}}$ (1). The information must respect this type of formulation of unitary infinitesimal transformation, where the singularity corresponds to a total break-down of spacetime; there is therefore a lower limit of possible elementary changes ("i=1/c", where "c" is the speed of light); this can be visualized in Okun's "cube of theories"; "I" of MIT being found there by (1; 1; 1)...

I intend to define an ultimate peace of reality (quantum reality related to Plank's constant h) based on information (I). Moreover, it helps better define the nature of time (try the Pythagoras-Einstein's theorem using "i") and to elaborate a QG, making it possible to unify GR and QM. The principle of least action (Noether, Maupertuis) is the physical hypothesis according to which the dynamics of a physical quantity can be deduced from a unique quantity called action, which depends on the physical quantity considered, and having a minimum value between two "*situation-states*" (info) [48]. A quick verification can be made with the relativistic Doppler-Fizeau effect (that is $1/c = \boldsymbol{\beta} = \mathbf{i}$ and from $(1 - \beta^2)$ with $(1 - i^2) = (1 + i).(1 - i) = I.\bar{I} = 2$). By developing one obtains $2^{½}$ (reciprocal of the factor of entanglement $2^{(-½)}$…). The standard perturbative approach to the quantization of GR attempted to base quantum gravity on a Feynman perturbation theory for graviton modes, of the form: $g_{ab} = \eta_{ab} + h_{ab}$ (2). Here h_{ab} is defined to be a small excitation on a flat background η_{ab}. This step (Feynman) was good because hereafter I shall tackle to specify how the information is justified and determined (distinct number of effective elementary changes), an infinitesimal difference between two situation-states of a specific entity, we have "$\psi = A.e^{i.p\cdot x}$" (3); by considering A=1 and "p.x = π.Ω", we obtain the following formula $\boldsymbol{\psi} = \mathbf{e}^{\mathbf{i}.\boldsymbol{\pi}.\boldsymbol{\Omega}}$ (4). The wave function ψ is interpreted (Max Born) as density of probability of a particle in the state space, density of "*local presence*" is $|\Psi(x)|^2$. The dynamics of the simplicity enables critical transitions resulting in reorganization of the complexity on processes exploring an "*area of possibilities*". It is close to Everett's relative state formulation. The transformation operator being unitary, it may be written $U = e^{i\varepsilon A}$ or A is hermitic (under the effect of an infinitesimal transformation ε « 1) : $\mathbf{U} = \mathbf{e}^{(\mathbf{i}\varepsilon\mathbf{A})} = \mathbf{1} + \mathbf{i}.\boldsymbol{\varepsilon}.\mathbf{A}$ (5); (following this we have $|\boldsymbol{\psi}\rangle = \mathbf{2}^{-½}\ \mathbf{(1; \pm i)}$) (6). By enlarging, this is the completed formula of the information: $\mathbf{I} = \mathbf{1} \pm \mathbf{i}$. So the great formula unifying eight constant fundamental mathematics, including the neutrals of the addition and the multiplication and the principal transcendent constants: 0, 1, *e*, *i*, π, Ω, ϕ and φ. With ***e*** representing the Analysis, ***i*** Algebra, ***π*** Trigonometry, **1** Trithmetic, **0** Numbers, **Ω** Probability, **ϕ** and **φ** Geometry. In fact, as Dirac said "*this equation knows many more things than I do about the universe...*", the information originating from the synchronicity of the real and the imaginary create from the effectiveness, a creative duality (emergence) between reality and imagination. "*The all-information*" ($I = 1 + i$; $\bar{I} = 1 - i$) still being more than the sum of the parts ("1"; "i"). This whole is never reducible to its parts and can no more be dissociated from its parts (one is inseparable from the other, and irreducible from each other). MIT set of equations is (1-D):

A) *Existence*: $\mathbf{1} + \boldsymbol{e}^{\mathbf{i}.\boldsymbol{\pi}.\boldsymbol{\phi}.\boldsymbol{\varphi}.\boldsymbol{\Omega}} = 0$, when Ω=1; (7)

B) *Propagation*: $\mathbf{1} + \boldsymbol{e}^{\mathbf{i}.\boldsymbol{\pi}.\boldsymbol{\phi}.\boldsymbol{\varphi}.\boldsymbol{\Omega}} = \mathbf{1} + \mathbf{i} = I$, when Ω= ½; (8)

C) *Interaction*: $\mathbf{1} + \boldsymbol{e}^{\mathbf{i}.\boldsymbol{\pi}.\boldsymbol{\phi}.\boldsymbol{\varphi}.\boldsymbol{\Omega}} = 2$, when Ω=0. (9)

However, a mathematical structure alone is not sufficient to explain physical phenomena, it must be completed by an interpretation… A datum is ultimately reducible to a lack of uniformity [61]; G. Bateson, whose slogan was: "*information is a difference which makes a difference*" ([29] L. Floridi[32]).

The genesis in science[33], and particularly in physics, is between hesitation and flashes. The current revolution revives our point of view on the ultimate nature of reality [10]. Thus our metaphysics must be transformed towards a single informational point of view (to get out of the disciplinary boundaries). I left the theoretically irrefutable assumption according to which complex phenomena necessarily result from the interaction between the more "*simple*" parts. Thus, in the universe, "*complex*" phenomena characterize the behaviour of a Whole in interaction. To describe reality, physicists[34] such as Witten, Green, Kaku or Hawking consider a spacetime with 11 dimensions, containing superstrings or membranes in vibration which would form particles. In itself it is already a revolution! In this case, what is time? In fact nobody showed mathematically the nature of time… C. Callender has written an interesting article on this subject ("*Is Time an Illusion*?" in Scientific American, June 2010). Einstein often said that "*time is illusion*", while Prigogine claimed that "*time is a construct*". Also, time is easy to perceive, but hard to define. In his article published in 1908, "*The Unreality of Time*", McTaggart put forth the notion that time is unreal. Indeed, the question whether time exists is a source of scientific problems as well as of philosophical ones. If space cannot be disassociated from time (Einstein) [33], the converse is also true. Hawking introduced the notion of imaginary time as the source of spacetime [36][37], but this imaginary time is seen as merely a mathematical device applied to his model. For our physical universe, 4-dimensional spacetime (x, y, z, t), the metrix, as defined by Poincaré and Minkowski, becomes: $ds^2 = dx^2 + dy^2 + dz^2 - c^2dt^2$. The letter "c" corresponds to the speed of light. Thanks to GR, the Pythagoras-Einstein equation may be written as follows ("ds^2" is the spacetime interval called the "displacement quadrivector": $ds^2 = c^2dt^2 - (dx^2 + dy^2 + dz^2)$. But Einstein never said that time was the fourth dimension; rather, he wrote that "$x_4 = i.c.t$". the 4th dimension is not time per se, but rather the "*i.c.t*" set, which allows to consider an imaginary time (synthesised, as and with the set of elementary forces in the imaginary unit in the MIT formula, "**t = i**"). And thus it is that my results indicate that reality, time and information emerge from a primordial causality [19]. This leads to a "*fractalising*" and unified view of the world, under the aegis of abstract mathematics[35] [34][39][49][54]. In this respect, Mandelbrot[36] gave his name to a family of fractals, defined by the "$I_{n+1} = I_n^2 + c$" recurrence relationship (8), where "c" is any complex number. The length of a fractal object depends on the scale against which it is measured, and has a non-integer Hausdorff dimension between 1 and 2. The idea of a non-integer dimension for information (quantum of reality) must therefore be accepted…

The complexity requires that the relations between the whole and the parts be understood [58][59]. P. Anderson said [27]: "*Complexity is more… and more is different*"; *i.e.* complexity appears as soon as there are many interacting agents or parameters, while a complex system will exhibit a behaviour which differs from that of its simple agents or of their sum… Emergence [26][53] is an organising physical principle which allows the appearance of laws which cannot be deducted from more fundamental physical principles. According to Kant, reality in itself is an unattainable limit. The reality that we can perceive is seen as a representation: "the world is my representation" but also "my will" by Schopenhauer [12]. E. Morin wrote: "*complex thinking is a thought which seeks both to distinguish (but not sever) and to link […] three principles are the dialogic, the recursion and hologrammatic principles*" [53]. In physics, the holographic principle is a speculative conjecture within the QG[37], proposed by Gerard't Hooft and later improved and promoted by Susskind [23][62]. My objective is to offer an informational interpretation thereof, as set forth herein. In a similar vein, my formulation (for Ω=½) recalls mirror symmetry (Calabi-Yau). Slowly, MIT's elegant mathematics themselves show me the way [30]. In this manner, the physics establishment must reconsider its basic notion of what constitutes physical reality[38]. I think we could use my MIT representation to construct an "*analog computation*" technique in order to dramatically increase the capabilities of many digital electronic devices (using floor & ceiling and roots of the zeta functions). To summarize, by accepting information as a base of reality[20] and by regarding it as such and at the same time "I" and "i" (according to the "*situation-state*" in the scale level), I could quickly present and unify the appropriateness of the quantum of reality (simplexity) based on information (relativity), argue over an emergent imaginary time of a paramount critical phase (fractal) and propose an extra-dimensional comprehension of the quantum gravitation (transcendence); an original synthesis: the **universal relativity theory**… My own belief is that physics will develop ultimately only if we get bright ideas for developing smart theories[39] [9][29][63][66]. Here are a few excerpts: "*[...] Those men who authored the fundamental inventions of a new paradigm were almost always young or newcomers in the field whole paradigm they changed. [...] Deciding one will reject a paradigm always entails simultaneously deciding to accept another one*". J. Gleick wrote (in "*The Chaos Theory*"): "*A new science appears from another which is in a deadlock. [...]*" [34].

Conclusions: *"Science marches towards uniqueness and simplicity" Poincaré*

In hindsight, I think the Laws of Nature are neither invented nor discovered, but revealed. The recent period of physics alternated between moments of elation and disappointment. The history of sciences is covered by topics where the true periphery only revealed itself gradually, through the stubbornness and a critical understanding by the most curious and most insightful people of their times. These problems are so deep that their questioning evokes the foundations of the universe and finally resolving them could provide a definitive answer on an entire fold of truth. Informational explanation of the forces unification equivalence is in the notion of simplex system [58][59], an elementary set of single and non separable particles and entangled states because the system is described by the measure as a network of potentialities (combinations of states are possible); there is no network of superposed states that propagate.

In this essay I therefore proposed to move towards a new theory based on information and serving as a base for a unique unifying paradigm of reality (*TUR*). P. Flichy sheds light on a global cultural shift in progress [41]: "*We are living a silent revolution: the rise to power of amateurs, these fans who are neither novices nor professionals, but brilliant jack-of-all trades*". Reality is neither digital (by "1") nor analogue (by "i") and yet it is both and more, by emerging from simplexity! With a ternary logic, a simplex structure[40] [58][59]. The fascination with understanding, the mathematical beauty has emerged as a criterion of truth in the decryption of Nature [35][36]. In theory and in practice, abstraction eventually does away with differentiated and interdependent "*beings*" to deal only with abstract, separable and independent functions. In essence, the information has an influence on its environment [67]. Einstein was surprised that the world was understandable [48], but is it really in its very essence [17]? So paradoxically, my equations realize the universality of abstractions of physics through the concept's informational consistency [69]. The ultimate answer seems to lie in an exteriority that transcends, goes beyond, but also explains the Real [8]. The impasses and paradoxes that we see today in science come from the separation between form and dynamics [2][38], that's what I propose to reconcile in shaping reality. Then it is necessary to change the reference system, to introduce a new way of understanding the dialectic of simplexity. Moreover, the epistemological complexification and practice has gradually caused to pass from the tree to the network[41], as tools to handle reality [60]. It seems that the perspective of the unification theories of QM and GR constitute a particularly fertile and appropriate ground for a large interdisciplinary collaboration. Are there definitive truths [28]? Drawing on the ideas of relationship, organization and emergence, I propose a pluralistic model that transcends the classical view of reality to evoke a world that is not fundamentally homogeneous [18]...

The model presented checks that explaining is not predicting [16][31][45]. Information is a concept designating, qualitatively, a composite and complex natural structure. Its improbability constitutes the world as a transcendent and as foreign in its unpredictability. The imaginary, far from being a mere denial of reality, is actually the revealer [42][56]. Lloyd[42] declared that "*the universe is a huge quantum computer running a program producing our cosmic reality, including ourselves*" [67], but for me the model is a tool that should not be confused with reality [35][46][66], because "*the map is not the territory*" (Korzybski). Indeed, the observed world can not completely be described by equations. As we know there is a strange and mysterious world that surrounds us, a world largely hidden from our senses [63][64], in superstring theory, the extra dimensions of spacetime. The "*hierarchy problem*" confers a very special character to the gravitational interaction. In fact, its intensity is immeasurably smaller than the other three known forces [68]. I am convinced that the relative weakness of gravity force compared to other interactions is due to the existence of extra dimensions (Randall, Sundrum, Susskind…). Thus, my formulation of reality provides a completely unusual solution concerning why they remain invisible ("*compact*" and "*wound*" on themselves). I discovered the unexpected [18], which is that visible and invisible are closely intertwined. If this is verified, it will result in an equally prodigious leap for physics, as majestic for mathematics. An achievement that will raise human knowledge about the mysterious reality of the world...

I find it amazing to realize that I could use my ignorance as a springboard and a true force of intellectual synthesis; to that end MIT[43] lead to deepest depths of human thinking, to its irreducible depths to successfully move beyond the "*limits*" of the knowable, to what seems increasingly unattainable by our own ability to imagine the world. Thanks to my long and hard solitary research, I understand that education does not make a genius. Also, now I know there are people who are not sharing their ideas to get approval, they are sharing them to educate others.
Surely, I have only been able to sketch here some of my sometimes enigmatic ideas of reality[44]...

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Notes (essay for *FQXi.org* "*A beautiful theory of Everything: how simplexity leads to reality!*" A.T. MAHAMBA)

[1] Its purpose is to disqualify the pertinence.
[2] "*The reason for being of an organization is to all ordinary people to accomplish extraordinary things*" P. Drucker.
[3] "*Exemplarity is not a way of influencing, it is the only one.*" A. Schweitzer.
[4] "*If one clings to a single idea with sufficient conviction, caresses it and cradles it carefully, it eventually produces its own reality*" P. Watzlawick.
[5] "*One must put one's genius into one's life and one's talent in one's deeds*" F. von Schlegel.
[6] "*All we need to succeed in life is ignorance and confidence.*" M. Twain.
[7] E. Morin considers autodidaxy to be the art of educating oneself: "*One must take advantage of various teachings. [...] What are the advantages of autodidaxy? It is that we are not subjected to the imprint of established dogmas and of things that appear obvious to the majority of others"*.
[8] "*Live as if you were to die tomorrow. Learn as if you would live forever.*" Gandhi
[9] "*Look at what everyone looks at and see what nobody sees.*" A. Londres.
[10] The slanderer is the one who feels menaced.
[11] "*Thinking is always taking a risk; but not thinking is taking an even greater risk*" H. Arendt.
[12] Like M-theory, the most sophisticated and most promising the Unification.
[13] From Greek mathesis: "*science*", and from Latin universalis: "*universal*" means the hypothesis of a primitive universal science, modeled on mathematics.
[14] "*If the idea is not a priori absurd, it is hopeless.*" A. Schweitzer.
[15] "*From the moment the idea of an essential truth imposes itself, telling the truth comes down to describing reality as it is*" P. Jorion.
[16] Shannon was very cautious with this term [24].
[17] "*We do not see things as they are, we see them as we are.*" A. Nin.
[18] Ex.: the binary operators based on two values "0" and "1" to respectively encode "*False*" and "*True*" (Bacon, Boole).
[19] "*In this new kind of physics, there is no room for both the field and matter, because the field is the only reality*" Einstein.
[20] "*A unified theory would allow stating the whole universe in a single concept, using a single word*" J. Jaffelin.
[21] In agreement with the theory of quantum decoherence and the symmetry groups as soon as there is information: "*The formulation of a new idea of reality is the most important and most difficult task of our time*" W. E. Pauli.
[22] "*What we conceive well is expressed clearly and the words to say it come easily*" N. Boileau.
[23] "*You can never reach an accurate and complete picture of reality*" Heisenberg in his book "*Philosophy*"
[24] Even if Shannon and Brillouin had an informational interpretation of entropy.
[25] "*We must assume that the "laws of complexity" exist that allow Nature to progress.*" Trinh Xuan Thuan [64].
[26] "I*t is our currently insufficient understanding of the fundamental laws of physics that prevents us from expressing the concept of spirit (mind) in physical or logical terms*" Penrose.
[27] "*Believe and you will understand; faith precedes, intelligence follows*" Saint Augustine.
[28] "*The concepts are, so to speak, the favorite points where the different levels of reality intertwine*" Heisenberg.
[29] "$e^{i.\pi} + 1 = 0$" is "*the most remarkable formula in math*" for Feynman.
[30] Normal number and universal number in all bases, incompressible and random at the same time; it combines the most extreme properties that a real number can possess, because it can be defined, but not calculated (Heisenberg's principle?).
[31] The golden section "$\phi = (1 + \sqrt{5})/2$", where "$\varphi.\phi = 1$", is the only positive solution of the equation "$x^2 = x + 1$".
[32] Floridi was one of the first philosophers to start studying the modern concept of information (Internet…).
[33] "We must invent new words to express new ideas" Peirce.
[34] Sometimes mathematically too hard to understand…
[35] "*The difficulty lies not so much in developing new ideas as in escaping from old.*" J. M. Keynes.
[36] He stated that, "*it is the essence of natural phenomena which obey this other kind of hazard where the Law of Large Numbers cannot be applied. The standard model leads us to bypass most of reality, and will even prevent us from seeing it*".
[37] Feynman [11] developed an original idea through the application of field theory to gravitation. Thus, he deducted that the graviton, a vector particle of gravity, would have no mass and would be a 2-spin boson (therefore relating to GR equations).
[38] *For illustration: <real| + |imaginary> = |information>; <Real| + |Information> = <Reality|.*
[39] *KISS: keep it simple and smart.*
[40] Simplexity is an emerging theory that proposes a possible complementary relationship between complexity and simplicity.
[41] As on a Porphyry's tree model (hierarchical arborescence).
[42] Having established the "Lloyd limit" (10^{120} bits): the number of information processed by the universe since the Big Bang.
[43] "*There is nothing more practical than a good theory.*" Poincaré.
[44] ***Relativity***: *Galileo invented it, Einstein understood it, Eddington saw it, and I feel it!*