MINIMUM CONTRADICTIONS SPACE-TIME ETHER - EVERYTHING

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Abstract

The purpose of this work is to show that our basic communication system, which consists of Aristotle logic, the sufficient reason principle included, and the anterior-posterior axiom is contradictory. Thus, any consequences of this system can derive with the aid of a claim for minimum contradictions. On this basis, space-time is stochastic and it leads to a Matter Space-Time Relativistic Quantum Mechanics; this mechanics has similarities and differences with both the Relativity Theory and the Quantum Mechanics. Thus, a minimum contradictions unified model is proposed and equations of minimum contradictions everything are stated. On this basis new explanations for various questions of physics are given the gravitation, the second thermodynamic law and the fractal behavior of matter systems included. This work is based on previous papers from 1994 until now and it is written so that it can be regarded as a unified whole.

1. Introduction

Every Physics Theory beyond its particular principles is stated based on the language basic communication system [1,2,3,4]. This system obeys the Aristotle logic (Classical Logic) [5,6], the Leibniz' Sufficient Reason Principle [7] -according to which for everything we seek the reason of its power- and a hidden axiom which states that "there is anterior-posterior". In fact, the way in which we communicate is not a simultaneous process but it is characterized by the existence of anterior and posterior; one word is put after another, one phrase after another e.t.c. [1,2,3,4].

The belief that a perfect theory can be found originates from the fact that we believe that the basic communication system is perfect. If this system is contradictory, it is meaningless to seek the statement of a perfect theory through a contradictory system.

According to this work the basic system of communication is contradictory. In fact if we call by Λ a logic consisting of the Classical Logic and the Sufficient Reason Principle, the following can be proved [8,9,10]:

Theorem I: " Any system that includes logic Λ and a statement that is not theorem of logic Λ leads to contradiction."

On the basis of Theorem I the following lemma can be stated:

Lemma: "Any system that includes logic Λ and a synthetic sentence leads to contradiction."

The anterior-posterior axiom constitutes a synthetic sentence; however additionally it can be proved that it is not theorem of Λ. Thus, the following is valid:

Statement I: " Any system that includes logic Λ and the anterior-posterior axiom leads to contradiction."

where the anterior – posterior axiom is stated as follows.

Anterior – Posterior Axiom:

a. There is a physical state named Anterior.

b. If there is Anterior, there is a sequent different state named Posterior.

Statement I can also be derived by the aid of Gödel's work and logic Λ [8]. It is noted that Gödel's work, through which his theorems have been stated, can not be used in the form of any of his statements; in fact this work is based on an arbitrary hypothesis i.e.:

Gödel's Hypothesis: "There is an algorithm that permits the derivation of only true statements"

The arbitrariness of this hypothesis lies on the fact that the algorithm mentioned is not precisely defined, as it has been noticed by H. Putnam, R. Penrose [11,12] and others [13]. By using logic Λ we can reach Statement I through Gödel's work [14] but without Gödel's hypothesis which could be regarded as a part of Λ. This is a verification of Statement I and Theorem I which is required in order that the basic claim of this work can be applied.

Despite of all these, when we communicate in a way that we consider logical, we could say that we try to understand things through minimum possible contradictions since contradictions are never vanished. On this basis we can state:

The Claim for Minimum Contradictions: " That which includes the minimum possible contradictions is accepted as valid".

According to this claim we obtain a logical and an illogical dimension. In fact, through this axiom we try to approach logic (minimum possible contradictions) but at the same time we expect something illogical since the contradictions cannot be vanished. However, the question is raised of whether this claim has any sense since one contradiction implies infinite contradictions [14]. The answer to this is that the claim for minimum contradictions creates a modification of the basic communication system since it implies a logic "attractor" through minimum possible contradictions required.

Every theory includes at least the principles of the basic communication system. According to theorem I, further axioms beyond the ones of basic communication must be avoided since they can cause further contradictions. Thus the Claim for Minimum Contradictions operates as a Simplicity Principle. This is compatible with Ockham's razor [15]; however Ockham's razor does not imply any contradiction.

The systems of axioms we use in Physics include the communication system and, therefore, their contradictions are minimized when they are reduced to the communication system itself. Therefore we can state:

We have minimum contradictions in Physics when it is based only on the basic communication system, i.e. on logic Λ *and on the "anterior-posterior axiom".*

In order that such physics is valid, a unifying principle is required, since everything, *i.e.* matter, field, and space-time, needs to be described in anterior-posterior terms.

<u>*In the first sight*</u>, for a minimum contradictions physics we can make the following statement:

Statement II: Any matter space-time system can be described in anterior–posterior terms.

It is noted that time implies the existence of anterior and posterior; space does, too. If I say 10cm, I mean the existence of anterior-posterior measuring states corresponding to 1,2,3….,10 cm. Therefore, the existence of anterior and posterior is the condition for space and time to exist and *vice-versa*. Thus, because of Statement II, for a least contradictory physics we can state the following statement:

Statement III: Any matter system can be described in space-time terms.

Since everywhere there is space-time and not something else, *Space-Time-Everything* can be regarded as *Matter-Ether*. A matter system, in general, has differences within its various areas. This means that a matter system, in

general, is characterized by different rates of anterior - posterior (time) within its various points. Since space is also locally affected by the local rate of anterior-posterior, it can be expected to be deformed due to different rates of anterior-posterior. This means that time can be regarded as a 4^{th} dimension which implies Lorentz' transformations and in extension a relativistic theory [16,17,18].

On this basis space-time can be regarded either *as geometry or as deformable matter- ether*; *this is compatible both with Einstein's and Poincaré's point of view* [19,20].

Basic tool of this work is the Hypothetical Measuring Field (HMF); this is a term initially proposed as "image Field" which has been changed in order to correspond exactly to what it signifies after a proposal by P.F.Parshin [17]. According to M.C.Duffy this term is compatible to an approach taken by Eddington and to recent studies on the physical vacuum based on information science in which material particles, which have a wave particle nature interact with an "image-taking field" [21].

As Hypothetical Measuring Field (HMF) is defined a hypothetical field, which consists of a Euclidean reference space-time, in which at each point A_0 the real characteristics of the corresponding, through the transformations of deformity, point A of the real field exist.

In a space-time description we don't know a priori what energy is; we define energy dE of an infinitesimal space-time element its 'ability to exist'. We may notice that an infinitesimal space-time element with energy dE exists on condition that some corresponding 'anterior-posterior' exist too (see Statement II) [16,17]. With respect to the HMF a space-time element exists during a time dt that is different from the time dt_0 of the corresponding reference space-time element. Various space-time elements in the HMF have different dt for the same dt_0. Thus, dt measures the duration *i.e.* the ability of a space-time element to exist; this ability, by definition is energy; when $dt = dt_0$, this ability is dE_0. Thus, we can write:

$$dE \sim dt \quad \text{and} \quad dE / dE_0 = dt / dt_0 \qquad \text{(a)}$$

which is a relativistic relation.

Eq. (a) can be viewed in two ways:

a) When dt_0 is a unit of time, Eq. (a) describes the duration dt, with respect to an observer and, as was mentioned, it leads to the relativity theory.

b) When dt is a constant period of time in the HMF, then Eq. (a) can be written in the form:

$$dE/dE_0 = dt/dt_0 = (f/v)/(f/v_0) = v_0/v \qquad \text{(b)}$$

where v is the frequency of a periodic phenomenon of comparison and f an arbitrarily constant factor through which we can change the scale of v, v_0. If $v = 1$, v_0 must be different in various points $(\boldsymbol{r}, t)$ of the HMF. If this is the case Eq. (b) can be written in the form:

$$dE/dE_0 = v_0(\boldsymbol{r}, t) \qquad \text{(c)}$$

Thus, for the same equation we have the following versions:

$dE/dE_0 = dt/dt_0$ observation (relativity theory) (d)

$dE/dE_0 = v_0(\boldsymbol{r}, t)$ action (quantum mechanics) (e)

On this basis, we can reach the basic De Broglie's principle for energy, for $E_0 = h$ (arithmetically) *i.e.* [17,18,20]:

$$E = hv \qquad \text{(f)}$$

<u>*In a second sight*</u>, because of the claim of the minimum contradictions, we conclude that *Matter-Space-Time-Everything-Aether* can have logical and contradictory behavior at the same time; *this can be valid only if space-time is stochastic.*

According to M.C.Duffy "The modern ether can be treated as a sea of information, and a generator of dynamic algebras, which is revealed as a discretum rather than a continuum on the smallest scales of space-time" [22]. This can be regarded as compatible to stochastic space-time which is not continuum on the smallest scales.

According to A.Pais, Einstein had said:

"I consider it quite possible that physics cannot be based on the field concept; i.e., on continuous structures. In that case nothing remains of my entire castle in the air, gravitation theory included, and the rest of modern physics" [23,24].

Despite of the fact that space-time may be stochastic, there are basic relativistic relations that continue to be valid; perhaps relativity principle can be stated on the basis of space-time operators as it will be mentioned.
At first sight, QM seems to remain unchangeable. However, what it describes, according to this work, is not a particle wave but the stochastic space-time in the Hypothetical Measuring Field (HMF). As was mentioned a De Broglie's basic principle can be regarded as an other view of a basic relativistic relation of matter space-time; De Broglie's principles can be proved as valid for stochastic space-time. On this basis, we have the frame in which a unified theory can be stated while the operators of relative length in a given direction and relative time are defined; by the aid of a Ψ wave function the geometry of stochastic space-time is described.
With starting point Prof. Santilli's paper: " Lie –Admissible Invariant Origin of Irreversibility for Matter and Antimatter at the Classsical and Operator Levels" [25], we may notice the following:
An operator can be regarded as the basic acting law which cause all phenomena revealed. On this basis, if invariance is valid *in general* at operator level, it means that the basic laws are invariant. This might be close to a new approach of relativity principle. Space-time operators, according to this work, are invariant to Lorentz' transformations [20]; however the final result i.e. real measurable space-time is non-relativistic, it seems to be fractal.
The stochastic space-time derives from the distribution of the properties of a flat relativistic space-time based on the probability density $P(\boldsymbol{r},t)$ of Schröndinger's relativistic equation which is proved as valid [16,18,20].
The negative values of $P(\boldsymbol{r},t)$ can correspond to the geometry of the anti-matter. The incomprehensible notion of the negative probability is compatible with the claim for minimum contradictions (since contradictions are always expected). However, the question is raised of whether Schröndinger's relativistic equation or Dirac's equation should be taken into account. As it is known from classical works Dirac's equation is based on the requirement for linear operators correlation. According to the spirit of this work, the linearity that is mentioned constitutes an additional restriction which is not theorem of logic Λ and therefore because of theorem I causes further contradictions beyond the ones imposed by the stochastic space-time consideration. Schröndinger's relativistic equation, without any potential term, can derive without any further assumption by the aid of Fourier analysis and corresponds to a least contradictions description [16,18,20]. It is noted that P. Rowlands

has noticed that fermions which derive from Dirac's equation do not describe a whole; "the particle and its "environment" can be considered as two "halves" of a more complete whole" [26]. It is noted that fermions have spin ½ which according to classical point of view corresponds to real particles. According to the spirit of this work we can have spin ½ due to coexisting local equivalent particles of gravitational (*g*) and electromagnetic (*em*) space-time even though they are described by Schröndinger's relativistic equation [20].
The electromagnetic (*em*) space-time is a space-time whose all magnitudes are considered imaginary and behave exactly like the gravitational (*g*). Electromagnetic (*em*) space-time is described by means of space-time wave functions such that:

$$\Psi_{em}(\boldsymbol{r}_{em}, t_{em}) = \Psi^{g}_{em}(\boldsymbol{r}, t) \qquad \text{(g)}$$

where Eq(g) has meaning due to the coexistence of (*g*) and (*em*) space-time under a scale. The way of coexistence and communication of (*g*) with (*em*) space-time is shown. On this basis space-time as a whole consists of:

1. real (*g*) space-time distributed according to a $P_g(\boldsymbol{r}, t)$ function revealing so (*g*) matter or antimatter for positive or negative values of $P_g(\boldsymbol{r}, t)$.
2. imaginary (*em*) space-time distributed according to a $P_{em}(\boldsymbol{r}, t)$ function revealing so (*em*) matter or antimatter for imaginary positive $(+i)$ or imaginary negative $(-i)$ values of $P_{em}(\boldsymbol{r}, t)$.

At this point we may notice that there are some similarities with P. Rowland's treatment where mass and charge space are independently symbolised and described [27].
The stochastic space-time has the property of self-similarity while, at the same time, it is chaotic (contradictory)- non-deterministic. It is something compatible with fractal geometry, which is a geometry of nature [20,28,29].
The force of the gravitation is interpreted as a force that is exerted on every infinitesimal element of the stochastic matter space-time in order that it is distributed according to a given probability density. The formula that derives, on certain conditions, is compatible with Newton law [17,18,20].
Basic element of this work is that space-time is statistically interpreted. Most of the conclusions derive on the basis of statistical relations related to various space-time magnitudes. These conclusions and consequences are related in a way through which the equations of minimum contradictions everything are

stated as well as to new explanations of various phenomena [18,20]. The reason why we have enough information to draw these conclusions is the clear statistical interpretation which is due to the property of Ψ wave functions to be everywhere self-normalized. In fact according to the claim for minimum contradictions the Ψ wave function of a matter system in general, is equivalent to local Ψ_i wave functions which obey Schröndinger's relativistic equation. L Local Ψ_i wave functions describe coexisting equivalent local (g) and (em) particle space-time fields which are regarded as extended to the infinity so that Schröndinger's relativistic equation probability density function $P(\boldsymbol{r},t)$ can apply. For this probability density function always is valid that:

$$\int P(\boldsymbol{r},t)dr^3 = 1 \qquad \text{(h)}$$

Because of the property of Ψ to be self-normalized we have clearly stated statistical relations which permit us to draw conclusions related to forces unification, spin interpretation, matter system quantization, second thermodynamic law derivation, arrow of time and fractal properties interpretation as well as to new explanation of various phenomena including possibility to technological applications [20]. There is not evidence that the statistical relations mentioned are valid in the case of a Dirac treatment. The property of self-normalization constitutes a basic difference in relation to existing current theories or new proposed ones which use the requirement for re-normalization [30,31]. This requirement derives from the necessity for various magnitudes to be statistically interpreted but through functions which by themselves do not imply a statistical nature. In these cases problems are raised related to various phenomena and mainly to description and interpretation of gravity. The statistical nature of space-time constitutes the basic consequence of the main principle of this work i.e. of the claim for minimum contradictions.

On this basis the Equations of Minimum Contradictions Everything are stated; geometry and forces per mass unit at a point $(\boldsymbol{r},t)$ of the HMF are defined.

This work derives from purely mental conclusions in contrast to theories which condense the experience which has been revealed. According to this work a theorist reaches to conclusions compatible with the ones of an experimentalist. This has similarities with E.J.Post' point of view where the starting point is the

notice that "it is remarkable that Mathematical Theorems can apply so perfectly in Physics" [32].

2. Logic Analysis [1,2,3,4]

Since Aristotle it is known that the way in which we communicate and prove various statements obeys the rules of classical logic i.e. the propositional and the predicate logic [5,6]. For the purposes of this paper Classical Logic is denoted as Principle I or P_I.

Apart from these rules Aristotle also stated the causality principle according to which for everything a reason-cause is needed. Leibniz expanded the causality principle and claimed more generally that something is valid if it can be logically proved by something else that is valid [7]. So, Leibniz' Sufficient Reason Principle could be written in the following form:

Principle II (P_{II}): "No statement is valid if it cannot be logically proved through some valid statements different from it."

We name logic Λ the system which includes principles I and II i.e.;

$$\Lambda \equiv P_I \cdot P_{II}$$

On this basis it can be proved the following [8,9,10]:

Theorem I: " Any system that includes logic Λ and a statement that is not theorem of logic Λ leads to contradiction."

On the basis of Theorem I the following lemma can be stated [8,9]:

Lemma: "Any system that includes logic Λ and a synthetic sentence leads to contradiction."

The anterior-posterior axiom constitutes a synthetic sentence; however additionally can be proved that it is not theorem of Λ. Thus, the following can be proved [8,9,10]:

Statement I: " Any system that includes logic Λ and the anterior-posterior axiom leads to contradiction."

where the anterior – posterior axiom is stated as follows.

Anterior – Posterior Axiom:
a. There is a physical state named Anterior.
b. If there is Anterior then there is a sequent different state named Posterior.

3. Gödel's Work [8,9]

3.1 General

Gödel's theorems derive on the basis of Aristotelian – Classical Logic part of which is the proposition logic and Peanno's Arithmetic axioms (PA). Basic statement which is basis for Gödel's Theorems proof is [14]:
Gödel's Basic Statement: "If formula G (Gödel's formula) can be proved, then its negation (~G) can be proved as well".
This implies that Peanno's Arithmetic (PA) is inconsistent; the inverse statement is not always valid and this implies that (PA) is simply w-non consistent.
However J.B.Rosser proved that if Theory T is an extension of (PA) [that is T can prove all theorems of (PA)], there is a formula R_T so that following theorem is valid:
Rosser's Theorem: " If formula R_T can be proved, its negation (~R_T) can be proved as well and vice versa".
On the basis of Basic Gödel's Statement and its corresponding inverse statement 2nd Gödel's Theorem can be stated as follows [14]:
Gödel's 2nd Theorem: "A consistent system including Peanno's arithmetic cannot be complete".
It is noted that this Theorem and Rosser's Theorem were proved on the basis of the following hypothesis [11,12,13]:
Gödel's Hypothesis: "There is an algorithm that permits the derivation of only true statements"
Of course this hypothesis is arbitrary because the algorithm mentioned is not precisely defined [11,12,13]. According to Hillary Putnam, Gödel's second incompleteness theorem states that if a system 'S' of formalized mathematics –

that is, a set of axioms and rules so precisely described that a computer could be programmed to check proofs in the system for correctness – is strong enough for us to do number theory in it, then a certain well-formed statement of the system, one which implies that the system is consistent, cannot be proved within the system [11]. As Putnam noticed, this Gödel's theorem had been misinterpreted; Gödel's hypothesis has not been proved in spite of efforts made by Church, Schröter and others [13]. Roger Penrose investigated the 2nd Gödel's Theorem and considering the fact that it is not valid completely in the form stated by Gödel, concluded that [12]:
Conclusion I: There is a part of our thinking which cannot be computational; this part could be investigated by laws of physics.
There are doubts that there is a possibility for non-computational thinking able to be investigated by the laws of physics to exist [11]; however, Penrose's conclusion completely takes into account what exactly has until now been proved [12].

3.2 **Proof of Statement I on the Basis of Gödel's Work** [8]

The Sufficient Reason Principle, for a system including arithmetic, can be stated as follows:
Sufficient Reason Principle:
a. If something is valid then it is provable.
b. *G formula is valid.*
In fact Statement (a) is immediate consequence of Principle P_{II} and includes Gödel's Hypothesis.
Statement (b) can be regarded as consequence of P_{II} since according to P_{II} nothing can prove itself; formula G states that it is not provable by itself. Therefore because of (b) formula G is valid which implies, according to (a), that G is provable.
On this basis "Basic Gödel's Statement" can be proved.
As was mentioned "Basic Gödel's Statement" is not inversely valid and this leads to w- non consistency of (PA). However in the case under study this inverse statement has not meaning because due to P_{II} formula G is always provable. Therefore it can be stated:
Basic Gödel's Statement Extension I: "A system including Mathematica Principia, Sufficient Reason Principle and Peanno's Axioms leads to contradiction".

Mathematica Principia is a part of classical logic (P_I) which is used in the text of any proof; thus, for this proof, have been used both P_I and P_{II} i.e logic Λ. Thus it can be stated:
Basic Gödel's Statement Extension II: "A system including logic Λ and Peanno's Axioms leads to contradiction".
This Statement coincides with Statement I on condition that natural numbers are regarded as corresponding to discrete physical states.
This proof constitutes a verification of Statement I which has been proved through a different way [8,9,10]. *This is a basic argument for Theorem I validity which is required in order that the Claim for Minimum Contradictions can be applied.*

4. The Claim of the Minimum Contradictions - Consequences

4.1 General [1,2,3,4]

According to what was mentioned in section 2 our basic communication system consists of logic Λ and the anterior-posterior axiom. Thus, the basic communication system obeys statement I; however, we notice that statement I cannot be stated because it is based on the basic communication system which, according to statement I itself, is contradictory.
Thus, statement I imposes the silence.
When we communicate, we use a hidden claim according to which *"what is accepted as valid is what includes the minimum possible contradictions"* since the contradictions cannot be vanished . According to this hidden claim, which we could name as *"claim of the minimum contradictions"* [3], we obtain a logical and an illogical dimension. In fact, through this axiom we try to approach logic (minimum possible contradictions) but at the same time we expect something illogical since the contradictions cannot be vanished.
It is noted that we cannot state that *this claim is true* because of statement I. According to this claim, statement I is accepted as valid because contradictions are permitted, but it leads to *silence. Thus, the claim of the minimum contradictions can be regarded only as a necessary condition of communication. Therefore, this claim, and whatever derives from it, includes*

the arbitrariness deriving from breaking the silence while, at the same time, it constitutes a tendency to logic.

Notice I: On the basis of the proposition logic, which is a part of logic Λ, the following statement can be proved [14]:

$$"S \supset (\sim S \supset V)" \qquad (1)$$

This means that:
"If statement S is valid then: if statement $\sim S$ is valid then any theorem V can be proved."
According to statement (1) if we have one contradiction, i.e. if S and $\sim S$ are valid at the same time, then anything can be proved. If this is the case then any set of statements $(A_1),(\sim A_1),(A_2),(\sim A_2),....,(A_N),(\sim A_N)$ can be proved i.e. any contradiction can be regarded as valid; N can be any number even infinite.
On this basis the claim for minimum contradictions would have not meaning since, according to what was mentioned, any contradiction is implied [33].
However, the claim for minimum contradictions is not a claim within logic Λ. It is a metalogical claim since it is used despite the fact that our basic communication system appears to be contradictory. This modifies our basic communication system since according to this claim there are not only contradictions but also a logical dimension deriving from the requirement for contradictions to be minimized. On this basis if a contradiction $(S)\cdot(\sim S)$ appears it does not imply that any contradiction is valid; *this gives sense to the claim for minimum contradictions.*

4.2. Compatibility with Relativity theory [17,18]

4.2.1. General

As was mentioned because of Statement I our basic communication system is contradictory. We consider a physics theory which beyond the basic communication system principles it includes further axioms. If such an axiom is theorem of logic Λ this axiom does not add any restriction – information beyond what is stated by the basic communication system.

If an axiom is not theorem of logic Λ and does not constitute tautology of the anterior – posterior axiom, the system that includes this axiom and the basic communication system leads to an additional contradiction, according to theorem I.
The systems of axioms we use in physics include the communication system and therefore, their contradictions are minimized when they are reduced to the communication system itself.
Thus, we have minimum contradictions in Physics when it is based only on the basic communication system i.e. on logic Λ and on the 'anterior-posterior axiom'.
In order that such physics will be valid everything, i.e. matter, field, space-time, should be described in anterior -posterior terms.
Thus, *at first sight*, for a least contradictory physics we can state the following statement:

Statement II: Any matter space-time system can be described in anterior – posterior terms.

It is noted that time implies the existence of anterior and of posterior; space does, too. If I say 10 cm, I mean the existence of 1,2,...,9,10 i.e. the existence of anterior and of posterior. Therefore, the existence of anterior and posterior is the condition for space and time to exist and vice - versa. Thus, because of statement II, for a least contradictory physics we can state the following:

Statement III: Any matter system can be described in space-time terms.

Since everywhere there is space-time and not something else, space-time can be regarded as matter itself. A matter system, in general, has differences within its various areas. This means that a matter system, in general, is characterised by different rates of anterior - posterior (time) within its various points. Since space is also locally affected by the local rate of anterior-posterior, is expected to be deformed due to different rates of anterior - posterior. According to the above mentioned, we can state the following corollary:

Corollary I: The existence of matter implies the existence of space-time and vice versa.

4.2.2. Definitions [17,18]

For the purposes of this paper the following definitions are useful:
i. *As reference spacetime we define a euclidean spacetime to which, through transformations of deformity, any field can be corresponded.* This reference spacetime is not only a geometrical notion because, according to the present hypothesis, it is also matter. Any magnitude of it will be denoted by the subscript $_0$. A point A_0 of the reference spacetime occupies by the action of the field a position $A \neq A_0$
ii. *As Hypothetical Measuring Field (*HMF) is defined *a hypothetical field, which consists of the reference spacetime, in which at every point* A_0 *the real characteristics of the corresponding point* A *of the real field exist.*
iii. *In a* HMF, *we define as relative spacetime magnitude sr the ratio of a real infinitesimal spacetime magnitude ds to the corresponding infinitesimal magnitude* ds_0 *of the reference spacetime*: i.e. $sr = ds / ds_0$. This can apply to any magnitude as follows :
α) Relative time $tr = dt / dt_0$, where *dt* is an infinitesimal time of comparison at a given position of the HMF.
b) *Relative length* in a direction $\boldsymbol{n}$ $lr_n = dl_n / dl_{n0}$ where dl_n is an infinitesimal length of comparison in a direction $\boldsymbol{n}$ and at a given time of the HMF.
c) *Relative volume* $vr = dv / dv_0$ where *dv* is an infinitesimal volume of comparison at a given time of the HMF.
The relative space-time magnitudes mentioned above, are denoted by SR,TR,VR,LR_n when they refer to mean values of a particle space time field. Relative spacetime magnitudes can apply either to a spacetime continuum, or to a statistical matter field. In the latter case the above magnitudes are denoted by $\overline{sr},\overline{tr},\overline{lr}_{n,}\overline{vr}$ where the superscript ($^-$) denotes the local mean value.
iv. It is defined as energy *dE* of an infinitesimal space-time element its ability to exist.

4.2.3. Relativistic Behaviour [17,18]

On condition that space-time is considered as continuum the relativity theory can be regarded as a possible consequence of statements II, III. In fact any infinitesimal area of a space-time continuum can be regarded as an area with constant rate of anterior-posterior and therefore it has not any space-time deformity. Thus, time is independent of space in this infinitesimal area and, since its rate is different in various points of the field, it can be regarded as a 4th dimension. Thus, in Riemans's 4-dimentional space with $dx_4 = kdt$, where k a constant with units of velosity so that dx_4 will have units of length, we can write [30,34]:

$$dS^2 = dx'^2 + dy'^2 + dz'^2 + k^2 dt'^2 =$$
$$= dx^2 + dy^2 + dz^2 + k^2 dt^2 \qquad (2)$$

For $k = ic$, where c is the speed of light, Eq(2) implies Lorentz' transformations which are the basis of the relativity theory. On this basis space-time can be regarded either *as geometry or as deformable matter- ether*; *this is compatible both with Einstein's and Poincaré's point of view* [19,20].
We can reach the same conclusion on the hypothesis that a perfect (non contradictory) physics theory can be stated; in this case, space-time is regarded as continuum. Statements II and III are also valid since a perfect theory, because of Theorem I, requires the non existence of further axioms - beyond the ones of the communication system – which might cause contradictions.
A consequence of Lorentz transformations is that:

$$dt / dt_0 = (1 - v^2 / c^2)^{-1/2} = \gamma \qquad (3)$$

where v an equivalent velocity of a space-time element dt and the time of a phenomenon of comparison. As is known, the application of Lorentz' transformations on Newtonian Mechanics leads to [30,34]:

$$dE / dE_0 = \gamma \qquad (4)$$

where dE and dE_0 are energy of infinitesimal space-times which correspond to each other through Lorentz transformations; it is noted that, according to

what was mentioned, these space-times are regarded as matter. Because of Eqs(3,4) we obtain:

$$dE / dE_0 = dt / dt_0 = tr \tag{5}$$

$$dE \sim dt \tag{6}$$

Relation (6) can be expressed by the following:

Statement IV: The energy of each changing infinitesimal space-time is equivalent to its internal time.

where internal time is a time of a phenomenon of comparison.
In the analysis above, Lorentz transformations derive from the claim for minimum contradictions and not from any other physical principle. However, Eqs(4,5) derive from the fact that we have accepted the Newtonian Mechanics as valid. The question raised is whether or not the Newtonian Mechanics is compatible with the minimum contradiction claim; thus it is more safe for relation (6) to derive directly from the claim for minimum contradictions without any further assumptions.
Because of corollary I we have that an infinitesimal space-time element with energy *dE* exists on condition that some corresponding 'anterior-posterior' exist too [16,17]. With respect to the HMF a space-time element exists during a time *dt* that is different from the time dt_0 of the corresponding reference space-time element. Various space-time elements in the HMF have different *dt* for the same dt_0. Thus, *dt* measures the duration *i.e.* the ability of a space-time element to exist; this ability by definition is energy (see definition iv); when $dt = dt_0$, this ability is dE_0. Thus, we can write:

$$dE \sim dt \tag{7}$$

i.e. relation (6).
Because of Lorentz's transformations, for flat space-times it is valid that:

$$E / E_0 = dE_i / dE_0 = \gamma_i = const. \tag{8}$$

where i indicates a point in the HMF. Since a flat space-time according to this paper is regarded as matter, it has mass, energy and momentum as well. Therefore, the SRT equation for energy and momentum is valid, i.e.:

$$E^2 = c^2 P^2 + {m_0}^2 c^4 \tag{9}$$

Because of Eq(5) and Lorentz' transformations it is valid [30,34]:

$$dE / dE_0 = dt / dt_0 = tr \tag{10}$$

$$tr = 1 / vr \tag{11}$$

4.2.4. Stochastic Behaviour [17,18]

<u>*At second sight*</u>, taking into account the above mentioned and applying the claim of the minimum contradictions, we reach the conclusion that matter-space-time has logical and contradictory behaviour at the same time; <u>*this can be valid when space-time is stochastic.*</u>
Statement IV can be extended to non relativistic forms. In fact, in a stochastic space-time we have from Eqs(10,11):

$$\frac{d\bar{E}}{dE_0} = \frac{\overline{dt}}{dt_0} = \bar{tr} = \overline{(\frac{1}{vr})} \neq \frac{1}{\bar{vr}} \tag{12}$$

where the superscript ($^-$) denotes the local mean value. Thus, we notice that $\frac{d\bar{E}}{dE_0} = \frac{\overline{dt}}{dt_0}$, which is compatible to the relativity theory and that $\bar{tr} \neq \frac{1}{\bar{vr}}$, which is non compatible.
We consider a flat matter space-time whose all space-time magnitudes equal the mean values of the same magnitudes of the field under study. Since this matter space-time is flat, Eq(9) is valid; thus, we reach the following conclusion:

Conclusion: Relativity Theory is compatible with the claim for minimum contradictions through Statement IV which is also valid for stochastic space-

times and through Eq(9) which is valid for the flat space-time that is composed of the mean values of a stochastic space-time matter field.

4.3. Compatibility with Quantum Mechanics [17,18]

4.3.1. General

Since Matter Space-Time, according to the Claim for Minimum Contradictions, is stochastic, we have that its energy, momentum and geometry are distributed according to a probability density function. In fact the existence of this function reveals the logical structure of a stochastic space-time, while it implies its contradictory nature. If we say that probability density function $P(\boldsymbol{r},t)$ exists, we accept that something, at the same space and time, can exist and not exist.

In the HMF, for a relative spacetime magnitude $\overline{sr}$ by definition it is valid that:

$$\left\langle \overline{sr} \right\rangle = \frac{1}{V_0} \int \overline{sr}(\boldsymbol{r},t) dr^3 \tag{13}$$

where V_0 is the volume of the reference space-time. According to this work, a flat space-time has energy. Note that if its energy density is non zero, it holds that for a finite energy the volume of the space-time mentioned cannot be infinite.

Because of corollary I, a space-time magnitude has the probability to exist on condition that there exists energy, i.e.matter. In the HMF, by definition, the energy distribution refers to real magnitudes of energy. Therefore, the probability density of a matter field describes the probability density of energy and of any space-time magnitude to exist in the HMF.

For the probability density it is valid that:

$$\int P(\boldsymbol{r},t) dr^3 = 1 \tag{14}$$

Thus, because of Eqs(13,14) we will have that:

$$\int P(\boldsymbol{r},t) \left\langle \overline{sr} \right\rangle dr^3 = \frac{1}{V_0} \int \overline{sr}(\boldsymbol{r},t) dr^3$$

and $\overline{sr}(\boldsymbol{r},t) = \langle \overline{sr} \rangle V_0 P(\boldsymbol{r},t)$ (15)

At first sight, the probability density mentioned could be the probability density that derives from the Quantum Mechanics. Therefore, the question is raised which set of statements of Quantum Mechanics is compatible with the claim for minimum contradictions.

4.3.2. Fourier Analysis [17,18]

A particle according to this paper can be regarded as a space-time formation, which changes in time. For the simple case of one dimension the process which describes the change mentioned can be analysed, according to Fourier analysis, in harmonic oscilations.
A space-time wave function $\Psi = \Psi(x,t)$ can be written in the form $\Psi = \Psi(x',t)$ where $x' = x'(x,n,t)$ as it will be explained. For a given t, according to Fourier analysis, the space-time function $\Psi(x',t)$ can take the form [35]:

$$\Psi = \sum_n (A_n \cos(2\pi n x'/L) + B_n \sin(2\pi n x'/L)) \quad (16)$$

where L is a proper interval which will be defined in the later and n=1,2,....
For $n \to \infty$ Eq.(16) describes a function $\Psi = \Psi(x,t)$.
The same form is valid for any t but with different $A_1, A_2, ...A_n, B_1, B_2, ...B_n$ $B_1, B_2, ...B_n$. Thus, in general we may assume that Ψ has the form of Eq(16) on condition that $A_1, A_2, ...A_n$ $B_1, B_2, ...B_n$ are functions of t.
By using the exponential form of cos. and sin., Eq(16) can be written:

$$\Psi = \sum_n (C_{1n} e^{i(2\pi n x'/L)} + C_{2n} e^{-i(2\pi n x'/L)}) \quad (17)$$

If we put:

$$x' = x - c_x t = x - \lambda_n(\omega_n / 2\pi)t = (\lambda_n / 2\pi)(x(2\pi/\lambda_n) - \omega_n t) \quad (18)$$

where $c_{nx}, \lambda_n, \omega_n$ are the velocity the wave length and the angular frequency of the harmonic wave, we will have that:

$$2\pi n x'/L = (2\pi n/L)\ (\lambda_n/2\pi)\ (x(2\pi/\lambda_n) - \omega_n t) \tag{19}$$

It is noted that for the same (*x,t*), the variable *x*' has different values for *n=1,2,3,4…* if c_{nx} has also different values for various n. In this case Ψ, as a function of variable *x'*, cannot be a continuous function of (*x,t*) ; however, in this case, Ψ can be regarded as a stochastic, statistically interpreted, function i.e. as a function which has a probability to exist for any variable $x'=x'(x,t, c_{nx})$ for any *n=1,2,3,……*

If $c_{nx} = const.$, the space-time function Ψ can be continuous since to the same (*x,t*) corresponds the same Ψ for *n = 1,2,3….* . Thus, the question is raised whether $c_{nx} = const.$ is valid.

According to the claim for minimum contradictions, the space-time wave function $\Psi(x,t)$ describes a stochastic space-time structure. Thus, this space-time function is compatible with this claim on condition that c_{nx} has different values for *n=1,2,….*

Thus, Eq(9) can take the form :

$$\Psi = \sum_m A_m e^{i((2\pi/\lambda_m)x - \omega_m t)} \tag{20}$$

only on condition that:

1. $\lambda_m = L/m$ *, i.e that L is the wave length of the first harmonic*

2.both $\lambda_m = L/n$ *and* $\omega_m = 2\pi c_x/\lambda_m$ *can take values with both signs* $\pm$ *so that all terms of Eq(9) can be included.* Such a thing is irrational; however, it is expected, according to the present claim; negative values can be regarded as corresponding to antimatter (see section 4.3.4.).

3.the space-time function Ψ *is a complex function which can be only statistically interpreted.*

In the general case of waves which are transmitted to various directions we can write:

$$\Psi = \sum_m A_m e^{i((2\pi/\lambda_m)\boldsymbol{e}_w \boldsymbol{r} - \omega_m t)} \tag{21}$$

where $\boldsymbol{e}_w$ is a unit vector which has the direction of wave velocity. This wave function is valid on condition that space-time has not any deformation. When the vibrating medium is space-time itself, we may assume that this wave function describes the HMF in which, by definition, there exist only local deformations. Thus, Ψ describes the changes of relative space-time magnitudes i.e. the changes of the rates of anterior-posterior at various points $(\boldsymbol{r},t)$ of the HMF (see definitions ii,iii).

4.3.3. De Broglie's principles [17,18]

From Eq(5) we have:

$$d\bar{E} / dE_0 = d\bar{t} / dt_0 = (f / \bar{n}_{eq}) / (f / n_0) = n_0 / \bar{n}_{eq} \tag{22}$$

where n is the frequency of a periodical phenomenon of comparison and f an arbitrarily constant factor through which we can change the scale of $\bar{n}_{eq}, n_0$; $\bar{n}_{eq}$ is a frequency which corresponds to $d\bar{t}$. If $\bar{n}_{eq} = 1$, n_0 must be different for every point $(\boldsymbol{r},t)$ of the HMF. If this is the case, $n_0(\boldsymbol{r},t)$ represents the number of hits of a clock connected with the point $(\boldsymbol{r},t)$ of the HMF in the unit of *real mean time* corresponding to this point. On this basis Eq(22) can be written in the form:

$$\overline{dE} / dE_0 = n_0(\boldsymbol{r},t) \tag{23}$$

Since, according to this paper energy-matter is nothing else than a system with different and changing rate of anterior - posterior, Eq(23) shows the way through which a field exists and acts at various points. The most general case of a space-time is when it refers to a gravitational wave. If this is the case $n_0(\boldsymbol{r},t)$ represents the frequency through which a space-time element dU "acts" at various points of the HMF in the unit of *real mean time* corresponding to this point. The term "acts" is used because, by definition, the

space-time element dU acts out of the HMF. This is compatible with the QM which is described through a non deformable reference space - time.
Thus, from Eqs(6,7,8,22,23) we have the following versions:

$$dE / dE_0 = dt / dt_0 \rightarrow \text{ observation} \quad (24)$$

(Relativity Theory)

$$\overline{dE} / dE_0 = n_0(\boldsymbol{r}, t) \rightarrow \text{ action} \quad (25)$$

(Quantum Mechanics)

For $n_0(\boldsymbol{r}, t) = \nu = const.$ in the whole extend of the field, because of Eq(25) we have:

$$\overline{E} = E_0 \nu \quad (26)$$

We notice that Eq(26) for $E_0 = h$ expresses one of the fundamental De Broglie's Principles. ν is the mean frequency of a space-time oscillation in the HMF. Since Eq(26) is valid for space-time oscillations in general it is valid also for harmonic oscillations. In the case of a photon which is described by Eq(9) for $m_0 = 0$ and simulated by harmonic oscillations we will have:

$$E = \sqrt{c^2 P^2} = cP \quad (27)$$

$$E = h\nu = cP, \quad \nu\lambda = c, \\ \omega = 2\pi\nu \quad and \quad \lambda = h / P \quad (28)$$

In the case of a particle in general, from Eq(9) we obtain:

$$E_{eq} = \sqrt{E^2 - {m_0}^2 c^4} = cP \quad (29)$$

where E_{eq} is the energy of an equivalent photon. Eq(27) refers to an oscillating matter space-time field which has no energy when the oscillation stops. Eq(29) refers to an oscillating matter space-time field with energy $m_0 c^2$

when the oscillation stops. Therefore, we may notice that the equivalent energy E_{eq} characterizes the creation of space-time waves. Thus, we can write:

$$E_{eq} = h\nu_{eq} = hc/\lambda_{eq} = cP, \quad and \quad \lambda_{eq} = h/P \tag{30}$$

For energy the general formula of Eq(26) is valid and therefore:

$$E = h\nu\,,\ \omega = 2\pi\nu\,, \quad \nu = c_w/\lambda_{eq} \neq c/\lambda_{eq} = \nu_{eq} \tag{31}$$

where c_w is different for various n as was mentioned in section 4.3.2.
For a particle field in general, because of Eqs(30,31), we have relations which are compatible with De Broglie's principles. The notion of wave length has sense since it refers to something that vibrates and this is space-time itself.
Since E, ν of Eqs(30,31) are mean values it holds that ω, λ_{eq} are mean values too regarded as being the same in the whole extent of a particle field.

4.3.4. Particle Field Space Time Wave

Taking into account Eqs(21,30,31) and considering that $\boldsymbol{P} = \boldsymbol{e}_w h/\lambda_{eq}$, we have:

$$\Psi = \sum_m A_m e^{i(\boldsymbol{P}_m \boldsymbol{r} - E_m t)/\hbar} \tag{32}$$

Due to the statistical interpretation of Ψ for an energy level E we have:

$$\Psi = e^{i(\boldsymbol{P}\boldsymbol{r} - Et)/\hbar} \tag{33}$$

From this equation we obtain:

$$\hat{E} = i\hbar\partial/\partial t \ \text{ and } \ \hat{P}_n = -\boldsymbol{n} i\hbar\partial/\partial x_n \tag{34}$$

i.e. the known, from the QM, operators for energy and momentum [36,37] .
From equations (9,33,34), we obtain Schröndinger's relativistic equation i.e.:

$$\hbar^2 \partial^2 \Psi / \partial t^2 - \hbar^2 c^2 \nabla^2 \Psi + {m_0}^2 c^4 \Psi = 0 \qquad (35)$$

In order that further contradictions are avoided, a matter system in general should be described through the same principles as a particle field is. This can be valid when a matter field locally behaves as a particle field; this is compatible with the Claim for Minimum Contradictions so that further assumptions can be avoided.
Since stochastic space time is matter itself, there does not exist a potential which acts from a far distance, but an action of matter-space-time itself in the whole extent of a matter system.
Thus, in a matter field, Eq(35) is valid locally and m_0 is constant only in an infinitesimal neighborhood of any point $(\boldsymbol{r},t)$ of the HMF.
According to this equation, the function $P(\boldsymbol{r},t)$, which can be regarded as probability density is [37]:

$$P(\boldsymbol{r},t) = (i\hbar / 2m_0 c^2)\left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^*\right) \qquad (36)$$

This function, according to what until now has been accepted, cannot be interpreted as probability density because it is not always positive. A negative $P(\boldsymbol{r},t)$ would imply, because of Eq(15), negative values of geometrical magnitudes and negative values of local energy as well. This is at first sight incomprehensible.
According to the claim for minimum contradictions, we try to apply logic but we have to expect contradictory behaviors; thus, negative values of geometrical magnitudes can be interpreted as contradictory-incomprehensible entities that appear because of our inadequate basic communication system. Of course, it would be constructive to investigate if these incomprehensible magnitudes appear as reactions to our communication system and constitute a reality that our basic communication system cannot approach. This point of view may be compared with Wittgenstein's point of view, i.e. with the process to approach reality through language games. According to the up-to-now gained experience, these negative magnitudes can be regarded as characterizing the anti-matter.

5. **Electromagnetic Space Time** [18,20]

According to what was mentioned, space-time is stochastic and it can be regarded as matter -ether. However, matter can be either mass or charge. Thus, there exist both mass-gravitational (*g*) and charge-electromagnetic (*em*) space-time. The (*em*) space-time behaves as a (*g*) space-time , since both are space-time and obey the same principles but it is not. Thus, any time interval in the (*em*) space-time is incomprehensible with respect to a coexisting (*g*) space-time and it can be regarded as an imaginary number which is incomprehensible too. *According to Statement IV, the energy of an infinitesimal (em) space-time can be regarded as imaginary since it is equivalent to an (em) time interval. Therefore, in general, the electromagnetic energy and in extension (em) magnitudes can be regarded as imaginary.* The electromagnetic space-time can be regarded as a four dimensional space-time which coexists with the gravitational one. Taking into account what was mentioned about negative geometrical magnitudes, we may assume that there exists also an anti-em space that corresponds to antimatter. Thus, space as a whole is described through sixteen dimensions, i.e. four dimensions for each of the following space-times: (*g*), (*anti-g*), (*em*) and (*anti-em*). It is noted that these space-times are revealed through positive or negative values of the corresponding probability density functions. Note that Eq(9) is valid for positive, negative imaginary and negative imaginary values of energy and momentum.

6. Properties of the Stochastic Matter Space Time

6.1. General

For the purposes of this paper, the conclusions and the properties of the stochastic Matter Space-Time – written in an explanatory way and deriving from previous works - are necessary. These conclusions relate both to a particle field and to a many bodies system.

6.2. Particle Field Stochastic Space Time [17,18]

6.2.1. Methodology and Results

In this section we intend to show the methodology to define the stochastic space-time-ether geometry and we will give the results without a complete proof; this proof is regarded as based on previous papers.

6.2.2. Space Time Operators [17,18]

We consider a flat space-time with energy E , momentum $\boldsymbol{P}$ and rest energy m_0c^2. With respect to reference space-time of energy E_0 it can be proved that its relative space-time magnitudes are the following:

Relative time : $$TR = \gamma = \frac{E}{E_0} \tag{37}$$

Relative volume: $$VR = \frac{E_0}{E}, \tag{38}$$

Relative length in a direction $\boldsymbol{n}$:

$$LR_n = (1 - \frac{\boldsymbol{v}_n^{\,2}}{c^2})^{1/2} \frac{E_0}{m_0c^2} = (1 - c^2 \frac{\boldsymbol{P}_n^{\,2}}{E^2})^{1/2} \frac{E_0}{m_0c^2} \tag{39}$$

According to what was mentioned, these magnitudes are distributed with the aid of $P(\boldsymbol{r},t)$ function of Eq(36).
Since these magnitudes are functions of energy and momentum, they have operators defined as follows:

$$\hat{TR} = \frac{i\hbar}{E_0}\frac{\partial}{\partial t}, \quad \hat{VR} = \frac{-iE_0}{\hbar}\frac{1}{\partial / \partial t},$$
$$\hat{LR}_n = \left(1 - c^2 \frac{\partial^2 / \partial x_n^{\,2}}{\partial^2 / \partial t^2}\right)^{1/2} \frac{E_0}{m_0c^2} \tag{40}$$

6.2.3. Space Time Relative Magnitude Mean Values [17,18]

According to the methodology of the QM, any equation between particle magnitudes is also valid between the operators of the same magnitudes [36,37]. It can be proved that for a self normalized Ψ function it is valid that the expectation value $\langle S \rangle$ of a space time magnitude S behaves as eigenvalue of S with eigenfunction Ψ [17,18], i.e.:

$$\hat{S}\,\Psi = \langle S \rangle \Psi \tag{41}$$

This self normalization can be achieved by means of $P(\boldsymbol{r},t)$ of Eq(36).
However, Eq(41) shows that any equation between operators of particle magnitudes is valid also between the expectation values of the same magnitudes. Thus, we may state the following :
" If the Ψ wave function of a particle field is self normalized any equation between particle magnitudes is valid also between the expectation values of the same magnitudes".
On this basis, we can reach the following results:

$$\langle TR \rangle = \frac{i\hbar}{E_0 \Psi}\frac{\partial \Psi}{\partial t}\,,\ \langle VR \rangle = \frac{-iE_0}{\hbar}\frac{\Psi}{\partial \Psi / \partial t}\,,$$

$$\langle LR_n \rangle = \left(1 - c^2 \frac{\partial^2 \Psi / \partial {x_n}^2}{\partial^2 \Psi / \partial t^2}\right)^{1/2} \frac{E_0}{m_0 c^2} \tag{42}$$

$$\hat{TR}\,\Psi = \langle TR \rangle \Psi, \quad \hat{VR}\,\Psi = \langle VR \rangle \Psi, \quad \hat{LR}_n\,\Psi = \langle LR_n \rangle \Psi \tag{43}$$

6.2.4 Relative Space Time Magnitude Local Mean Values

Taking into account Eq(35), we have:

$$\Box\Psi = -{m_0}^2 \Psi\,, \qquad m_0 = i\left(\frac{\Box\Psi}{\Psi}\right)^{1/2} \tag{44}$$

where $\Box = \partial^2 / \partial t^2 - c^2 \nabla^2$

As we can notice, the probability density of Eq(36) is dependent on m_0. Taking into account Eqs(15,36,42,44) , we can calculate the mean value of relative time and of relative length in a direction $\boldsymbol{n}$ as follows [17,18,20]:

$$\overline{tr}(\boldsymbol{r},t) = \frac{ic}{2h} \frac{\partial_t \Psi}{(\Psi \Box \Psi)^{1/2}} \left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^* \right) \tag{45}$$

$$\overline{lr}_n(\boldsymbol{r},t) = -\frac{ih}{2} \frac{\Psi}{\Box \Psi} \left(1 - c^2 \frac{\partial^2 \Psi / \partial x_n{}^2}{\partial^2 \Psi / \partial t^2} \right)^{1/2} \left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^* \right) \tag{46}$$

By means of integration, Eqs(45,46) can provide the real time that passes in a position of the HMF and the real distance at the time *t* between two points of the HMF.

6.3. Many Bodies System [17,18,20]

6.3.1. General

The so far analysis has shown that we can express a particle field in space-time terms. However, there is always function Ψ that depends on a mass m_0. A more general description of space should be independent of any notion of mass. According to Eq(35), for gravitational space-time, Schröndinger's relativistic equation is valid; this can be written as follows:

$$\frac{\partial^2 \Psi_g(\boldsymbol{r},t)}{\partial t^2} - c^2 \nabla^2 \Psi_g(\boldsymbol{r},t) = -(m_{0g} c / \hbar)^2 \Psi_g(\boldsymbol{r},t) \tag{47}$$

If we put : $\Box = \partial^2 / \partial t^2 - c^2 \nabla^2$

we obtain:

$$\frac{\Box\Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)} = -(m_{0g}c^2/\hbar)^2 \tag{48}$$

$$\frac{\partial}{\partial x_j}\frac{\Box\Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)} = 0 \qquad (j = 1,2,3,4) \tag{49}$$

We notice that Eq(49) is independent of mass m_0.

It is noted that the electromagnetic (*em*) field for the same reasons as the (*g*) does, is described with the aid of an electromagnetic (*em*) hypothetical measuring field through electromagnetic coordinates $(\mathbf{r}_{em}, t_{em})$. However the (*em*) HMF coexists with the (*g*) HMF while $(\mathbf{r}_{em}, t_{em})$ corresponds to $(\mathbf{r}, t)$ through a scale so that [20,38,39]:

$$\frac{\partial x_{jg}}{\partial x_{jem}} = i\alpha \qquad (j = 1,2,3,4) \tag{50}$$

where α is the fine structure constant. If $\Psi_{em}(\mathbf{r}_{em}, t_{em})$ is the (*em*) space-time wave function we define as function $\Psi^g_{em}(\mathbf{r}, t)$ a function for which is valid that:

$$\Psi_{em}(\mathbf{r}_{em}, t_{em}) = \Psi^g_{em}(\mathbf{r}, t) \tag{51}$$

This is the reason why space-time as a whole i.e. Minimum Contradictions Ether Everything can be described by means only of coordinates $(\mathbf{r}, t)$ of (*g*) space-time.

Thus for the same reasons, valid for (*g*) space-time, for an (*em*) space-time particle field we can write:

$$\frac{\Box\Psi^g_{em}(\boldsymbol{r},t)}{\Psi^g_{em}(\boldsymbol{r},t)} = -(m_0c^2/\hbar)^2 \tag{52}$$

$$\frac{\partial}{\partial x_j}\frac{\Box\Psi^{g}_{em}(\boldsymbol{r},t)}{\Psi^{g}_{em}(\boldsymbol{r},t)}=0 \qquad (j=1,2,3,4) \tag{53}$$

According to the Claim for Minimum Contradictions in order that further contradictions are avoided, a matter system in general should be described through the same principles as a particle field does. This can be valid when a matter-space-time field locally behaves as a space-time-particle field and obeys Eqs(49,53) which express basic laws where matter-space-time obeys. These equations imply a statistical interpretation and a distribution of matter space-time according to Eq(36) applied either for (*g*) or (*em*) space-time i.e. according to:

$$P(\boldsymbol{r},t)=(i\hbar/2m_0c^2)\left(\Psi^*\partial_t\Psi-\Psi\partial_t\Psi^*\right) \tag{54}$$

Eq(54) is valid only on condition that the space-time particle field described is extended to the infinity [37].
In this case, Ψ function locally is described by an equivalent local space-time particle field wave function Ψi, where this field is regarded as extended to the infinity. This can occur when Ψ is derivable everywhere but its derivatives are not continuous, which means that Eqs(48,52,54) are valid with different m_{0g} or m_{0em} in the vicinity of various $(\boldsymbol{r},t)$. The fact that Ψ_i obeys the same law everywhere implies a similar geometry everywhere; as it will be shown the field under study has the property of self-similarity which is the basic characteristic of fractal geometry [28,29].
On this basis Eq(15) can be extended to a many bodies system so that:

$$\overline{sr}(\boldsymbol{r},t)=\left\langle\overline{sr}\right\rangle_i V_0 P_i(\boldsymbol{r},t)=\left\langle\overline{sr}\right\rangle V_{0T}P(\boldsymbol{r},t) \tag{55}$$

where V_0, $\left\langle\overline{sr}\right\rangle_i$, $P_i(\boldsymbol{r},t)$ refer to local particle fields and V_{0T}, $\left\langle\overline{sr}\right\rangle$, $P(\boldsymbol{r},t)$ to the whole matter system.
Notice:
In the reality the equivalent local particle field is not extended everywhere unless the whole constitutes a particle field. The part of this particle field which exists in reality is an infinitesimal area around the point $(\boldsymbol{r},t)$; this area

behaves as if this local particle field was extended to the infinity. On this basis the coexistence of (*em*) and (*g*) space-time in an infinitesimal area of a point $(\boldsymbol{r},t)$ can be studied by the aid of local coexisting (*em*) and (*g*) space-time particle fields regarded as extended to the infinity. Thus, as it will be shown the communication between (*em*) and (*g*) infinitesimal space-time around a point $(\boldsymbol{r},t)$ is studied by the aid of a closed system consisting of (*em*) and (*g*) particle fields regarded as extended to the infinity.

6.3.2. Communication Between (*g*) and (*em*) Local Particle Fields

6.3.2.1 Discontinuity of Mean Values

From Eq(41) for energy and momentum we have:

$$i\hbar\partial\Psi/\partial t = \langle E\rangle\Psi\,, \qquad -i\hbar\nabla\Psi = \langle \boldsymbol{P}\rangle\Psi \tag{56}$$

According to section 6.2.3. we have that *" If the* Ψ *wave function of a particle field is self normalized any equation between particle magnitudes is valid also between the expectation values of the same magnitudes"*. Therefore we have:

$$\langle E\rangle^2 = c^2\langle \boldsymbol{P}\rangle^2 + {m_0}^2c^4 \tag{57}$$

Because of Eqs(56,57) we obtain:

$$i\partial_t\langle E\rangle + \langle E\rangle^2 = c^2\langle \boldsymbol{P}\rangle^2 + {m_0}^2c^4 \tag{58}$$

Thus, from Eqs(57,58) we take $\partial_t\langle E\rangle = 0$; since $\langle E\rangle$ is position independent we have:

$$\frac{d}{dt}\langle E\rangle = 0 \tag{59}$$

Eq(59) shows energy conservation; at the same time it shows that if $\langle E \rangle$ changes then it changes in a discontinuous way. Because of Eqs(57,59) we obtain:

$$\frac{d}{dt}\langle P \rangle = 0 \tag{60}$$

6.3.2.2 (em) and (g) Communication-Conservation Principles

According to the spirit of this work Eq(59) is valid both for the (*g*) and the (*em*) space. Therefore, we have:

$$\frac{d}{dt}\langle E_g \rangle = 0, \quad \frac{d}{dt}\langle E_{em} \rangle = 0 \tag{61}$$

Eqs(61) show that $\langle E_g \rangle$ and $\langle E_{em} \rangle$ are constant in time; however if the (*g*) space-time communicated with the (*em*) one, the changes of $\langle E_g \rangle$, $\langle E_{em} \rangle$ should be discontinuous.
We may notice that if $m_0 = 0$, Eq(57) is valid both for real and imaginary energy and momentum. Thus, we may assume that only photons ($m_0 = 0$) can convert (*g*) space-time into (*em*) one and inversely.
Because of Eq(61) we obtain:

$$\frac{d}{dt}\langle E_{em-g} \rangle = 0 \tag{62}$$

where $E_{em} = iE_{em-g}$; E_{em-g} can express energy which can be converted from (*em*) into (*g*) form.
In a closed system consisting of a real (*g*) space-time particle field and a coexisting imaginary (*em*) one, by definition, there are not photons which flow out the system while energy conversion, according to Eq(61), takes place only through photons.
Thus in the case of energy conversion of a closed system we have:

$$d\left\langle E_g \right\rangle + d\left\langle E_{em-g} \right\rangle = 0 \tag{63}$$

$$\left\langle E_g \right\rangle + \left\langle E_{em-g} \right\rangle = const. \tag{64}$$

Eqs(63,64) express the energy conservation principle of the closed system mentioned consisting of a gravitational and a coexisting electromagnetic space-time particle field.
Therefore Eqs(63,64) can apply to the coexisting local space-time particle fields of section 6.3.1. (see notice). It is noted that the energy conservation principle as it has been expressed by the Eqs(63,64) is compatible with the 1st Thermodynamic Axiom.
Because of Eq(57) any change of energy implies a change of momentum and vise versa. Therefore energy changes through photons imply momentum changes through the same photons. This implies that in the case of energy-momentum conversion we will have:

$$d\left\langle P_g \right\rangle + d\left\langle P_{em-g} \right\rangle = 0 \tag{65}$$

$$\left\langle P_g \right\rangle + \left\langle P_{em-g} \right\rangle = const. \tag{66}$$

Eqs(65,66) should be valid for any direction of vectors $\left\langle \boldsymbol{P}_g \right\rangle, \left\langle \boldsymbol{P}_{em-g} \right\rangle$; therefore we should have:

$$d\left\langle \boldsymbol{P}_g \right\rangle + d\left\langle \boldsymbol{P}_{em-g} \right\rangle = 0 \tag{67}$$

$$\left\langle \boldsymbol{P}_g \right\rangle + \left\langle \boldsymbol{P}_{em-g} \right\rangle = const. \tag{68}$$

Since mean values are position independent, Eqs(64,68) can be written as follows:

$$\frac{\partial}{\partial t}(\left\langle E_g \right\rangle + \left\langle E_{em-g} \right\rangle) = 0 \tag{69}$$

$$\frac{\partial}{\partial t}(\langle \boldsymbol{P}_g \rangle + \langle \boldsymbol{P}_{em-g} \rangle) = 0 \tag{70}$$

Taking into account Eq(41) for energy and momentum in (*g*) and (*em*) space-time and Eqs(69,70) we obtain:

$$\partial_t (\frac{\partial_t \Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)} + \alpha \frac{\partial_t \Psi^g_{em}(\boldsymbol{r},t)}{\Psi^g_{em}(\boldsymbol{r},t)}) = 0 \tag{71}$$

$$\partial_t (\frac{\nabla \Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)} + \alpha \frac{\nabla \Psi^g_{em}(\boldsymbol{r},t)}{\Psi^g_{em}(\boldsymbol{r},t)}) = 0 \tag{72}$$

Eqs(71,72) express the energy and momentum conservation of the coexisting equivalent local space-time particle fields characterized by local space-time wave functions $\Psi_{gi}(\boldsymbol{r},t)$ and $\Psi^g_{emi}(\boldsymbol{r},t)$; these functions in an infinitesimal vicinity of a point $(\boldsymbol{r},t)$ coincide with $\Psi_g(\boldsymbol{r},t)$ and $\Psi^g_{em}(\boldsymbol{r},t)$ wave functions of the whole matter field.

6.4. Equations of Minimum Contradictions Ether-Everything [38,39]

On the basis of the claim for minimum contradictions we have the set of equations which all together characterize a Matter Space-Time Field as a whole. Since this field includes everything, this equation set can be regarded as Equations of Minimum Contradictions Everything. As long as ether is regarded as the substance within things exist and from which things are made, the equations set mentioned, can be regarded as Equations of Minimum Contradictions Ether-Everything. On the basis of what has been mentioned in 6.3. and 6.2.4. these equations are the following [20,38,39]:

1. Space-Time Wave Equations (Schröndinger's relativistic equation):

$$\frac{\partial}{\partial x_j} \frac{\Box \Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)} = 0 \qquad (j = 1,2,3,4) \tag{73}$$

$$\frac{\partial}{\partial x_j}\frac{\Box\Psi^g_{em}(\boldsymbol{r},t)}{\Psi^g_{em}(\boldsymbol{r},t)}=0 \qquad (j=1,2,3,4) \tag{74}$$

2. *Energy Conservation:*

$$\partial_t\left(\frac{\partial_t\Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)}+\alpha\frac{\partial_t\Psi^g_{em}(\boldsymbol{r},t)}{\Psi^g_{em}(\boldsymbol{r},t)}\right)=0 \tag{75}$$

3. *Momentum Conservation:*

$$\partial_t\left(\frac{\nabla\Psi_g(\boldsymbol{r},t)}{\Psi_g(\boldsymbol{r},t)}+\alpha\frac{\nabla\Psi^g_{em}(\boldsymbol{r},t)}{\Psi^g_{em}(\boldsymbol{r},t)}\right)=0 \tag{76}$$

4. *Geometry of (g) space-time i.e. mean relative time and mean relative length in a direction* $\boldsymbol{n}$ *at a point* $(\boldsymbol{r},t)$*:*

$$\overline{tr}(\boldsymbol{r},t)=\frac{ic}{2h}\frac{\partial_t\Psi}{(\Psi\Box\Psi)^{1/2}}\left(\Psi^*\partial_t\Psi-\Psi\partial_t\Psi^*\right) \tag{77}$$

$$\overline{lr}_n(\boldsymbol{r},t)=-\frac{ih}{2}\frac{\Psi}{\Box\Psi}\left(1-c^2\frac{\partial^2\Psi/\partial x_n{}^2}{\partial^2\Psi/\partial t^2}\right)^{1/2}\left(\Psi^*\partial_t\Psi-\Psi\partial_t\Psi^*\right) \tag{78}$$

5. *Geometry of (em) space-time i.e. mean relative time and mean relative length in a direction* $\boldsymbol{n}$ *at a point* $(\boldsymbol{r},t)$*:*

$$\overline{tr}_{em}(\boldsymbol{r},t)=-\frac{\alpha c}{2h}\frac{\partial_t\Psi^g_{em}}{(\Psi^g_{em}\Box\Psi^g_{em})^{1/2}}\left(\Psi^g_{em}{}^*\partial_t\Psi^g_{em}-\Psi^g_{em}\partial_t\Psi^g_{em}{}^*\right) \tag{79}$$

$$\overline{lr}_{nem}(\boldsymbol{r},t)=-\frac{h}{2\alpha}\frac{\Psi^g_{em}}{\Box\Psi^g_{em}}\left(1-c^2\frac{\partial^2\Psi^g_{em}/\partial x_n{}^2}{\partial^2\Psi^g_{em}/\partial t_t{}^2}\right)^{1/2}\left(\Psi^g_{em}{}^*\partial_t\Psi^g_{em}-\Psi^g_{em}\partial_t\Psi^g_{em}{}^*\right)$$

(80)

where α is the fine structure constant, Ψ_g , Ψ_{em}^{g} are the gravitational and the electromagnetic space-time wave functions, which are identical with equivalent local particle Ψ_i functions, and $(\mathbf{r},t)$ is a point of the hypothetical measuring field (HMF).

6.5. Gravitation [20,40]

According to this work the energy of a space-time particle field is distributed according to probability density function $\boldsymbol{P}(\boldsymbol{r},t)$. Because of Eqs(15,37,43) we have [20,40]:

$$\overline{tr}(\boldsymbol{r},t)=\frac{\langle E\rangle}{(E_0/V_0)}P(\boldsymbol{r},t)=\frac{\langle E\rangle}{DE_0}P(\boldsymbol{r},t) \tag{81}$$

where DE_0 is the energy density of the reference space-time. The energy

$$\langle E\rangle P(\boldsymbol{r},t)dr^3 \tag{82}$$

corresponds to a mass

$$d\overline{m}=\frac{\langle E\rangle}{c^2}P(\boldsymbol{r},t)dr^3 \tag{83}$$

In order to that mass to move in a direction x_i from the energy level

$$\langle E\rangle P(\boldsymbol{r},t)dr^3 \tag{84}$$

to the energy level

$$\langle E\rangle(P(\boldsymbol{r},t)+\frac{\partial P(\boldsymbol{r},t)}{\partial x_i}dx_i)dr^3 \tag{85}$$

a force $d\boldsymbol{F}$ is needed so that $d\boldsymbol{F}dx_i$ equals the diference of the mentioned energy i.e.:

$$d\boldsymbol{F}\,dx_i = \langle E\rangle \frac{\partial P(\boldsymbol{r},t)}{\partial x_i} dx_i dr^3 \tag{86}$$

Because of Newton's Law we have:

$$d\boldsymbol{F} = d\overline{m}\,\mathbf{g}_{xi} \tag{87}$$

The magnitude $\mathbf{g}_{xi}$ can be regarded as the component of the gravitational acceleration of the field in the direction x_i, since it represents the force which must be applied to a unit of mass at every point $(\boldsymbol{r}, t)$ in order that energy will be distributed according to the probability density function $P(\boldsymbol{r},t)$. Because of Eqs(83,86,87) we obtain:

$$d\overline{m}\mathbf{g}_{xi} = \frac{\langle E\rangle}{c^2} P(\boldsymbol{r},t) dr^3 \mathbf{g}_{xi} = \langle E\rangle \frac{\partial P(\boldsymbol{r},t)}{\partial x_i} dx_i dr^3 \tag{88}$$

$$\mathbf{g}_{xi} = \frac{c^2}{P(\boldsymbol{r},t)} \frac{\partial P(\boldsymbol{r},t)}{\partial x_i} \tag{89}$$

Taking into account Eqs(81,89) we obtain in general that:

$$\mathbf{g}(\boldsymbol{r},t) = \frac{c^2}{P(\boldsymbol{r},t)} \nabla P(\boldsymbol{r},t) = \frac{c^2}{\overline{tr}(\boldsymbol{r},t)} \nabla \overline{tr}(\boldsymbol{r},t) \tag{90}$$

From Eq(90) for a particle field, because of Eq(54), we obtain:

$$\mathbf{g}(\boldsymbol{r},t) = \frac{c^2 \nabla\left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^*\right)}{\left(\Psi^* \partial_t \Psi - \Psi \partial_t \Psi^*\right)} \tag{91}$$

Eqs(90,91) are valid in the whole extent of a matter field since a matter field locally can be regarded as a particle field. Eqs(90,91) describe a unified equation which is valid everywhere.
Eqs(90,91) are valid either for (*g*) or (*em*) space; therefore, all forces are based on a unified formula. It is noted that Eq(90), under certain assumptions, is compatible with Newton's law [20,40].

7. New Explanations

7.1. Notion of Time Flow

In a closed system , the conservation principle can be applied as follows:

$$\overline{E}_g + \overline{E}_{em-g} = \text{constant} \tag{92}$$

where $\overline{E}_{em} = i\overline{E}_{em-g}$ and the dash ($\bar{}$) indicates the mean value.
It can be proved that $\overline{V}_g \uparrow \Rightarrow \overline{E}_g \downarrow$; thus, because of Eq(92) the expansion of universe [20] is characterized by the relation $\overline{V}_g \uparrow \Rightarrow \overline{E}_g \downarrow \Rightarrow \overline{E}_{em-g} \uparrow$ i.e. the evolution of Universe expresses the passage from $\overline{E}_g$ to energy $\overline{E}_{em-g}$; since, according to Statement IV, energy is equivalent to time, this passage-change expresses what we consider as Time Flow [41].

7.2. The Property of Self-similarity

Because of Eq(55), for a relative length in a direction $\boldsymbol{n}_1$ *and* $\boldsymbol{n}_2$ in a matter system it is valid that:

$$\overline{lr}_n(\boldsymbol{r},t) = \left\langle \overline{lr}_n \right\rangle_i V_0 P_i(\boldsymbol{r},t) = \left\langle \overline{lr}_n \right\rangle V_{0T} P(\boldsymbol{r},t) \tag{93}$$

Applying this equation for two different directions $\boldsymbol{n}_1$ *and* $\boldsymbol{n}_2$ we obtain:

$$\frac{\overline{lr}_{n1}(\boldsymbol{r},t)}{\overline{lr}_{n2}(\boldsymbol{r},t)}=\frac{\overline{dl}_{n1}}{\overline{dl}_{n2}}=\frac{\left\langle \overline{lr}_{n1}\right\rangle}{\left\langle \overline{1r}_{n2}\right\rangle}=c_s \tag{94}$$

where $\overline{dl}_{n1},\overline{dl}_{n2}$ the mean real infinitesimal lengths in the directions $\boldsymbol{n}_1$ and $\boldsymbol{n}_2$ respectively, corresponding to the same infinitesimal length of the reference spacetime, at any point $(\boldsymbol{r},t)$ of the HMF; c_s has the same value in the whole extent since it is equal to a ratio which refers to the whole. Thus, the above relation expresses the self similarity of the matter system at time *t* in the whole of its extent. It is noted that $\overline{dl}_{n1},\overline{dl}_{n2}$ are lengths which correspond to matter since space-time itself is matter. Taking into account the above mentioned, we can conclude that the stochastic matter space-time has fractal properties because of the self similarity Eq(94). It is noted that the geometry of matter systems in nature appears to be fractal-selfsimilar [28,29,42]; therefore it is expected that this fractal geometry can apply to any matter space-time system. Perhaps the property of self similarity could facilitate us to solve the problem of stochastic space-times since observable holistic properties can apply to infinitesimal areas; thus, the weakness due to Ψ function boundary conditions [20] might be overcome.

7.3. Possibility to Technological Application [8,18,20]

7.3.1. Light Water Electrolysis

Taking into account the energy conservation principle for a closed system we can reach to the following empirical statement [8,20]:
Empirical Statement I: "During the approach of an electron with a proton there is absorption of gravitational energy".
As Empirical Statement we define a statement compatible with the theory proposed having a possibility to be verified through an experimental way. Thus a verification of an Empirical Statement will constitute a verification of the theory proposed and vice-versa.
On the basis of the Empirical Statement I it can be explained why excessive heat is generated during the electrolysis of light water under Kanarev's

plasma electrolysis [43] and R.Mills patent [44]. Both cases can be explained through an irreversible proton-electron approaching-distancing process [45,46].

7.3.2. Asymmetric Capacitor Propulsion

Since Empirical Statement I includes the meaning of "gravitational energy absorption" obliges to extend to the direction of momentum. A generalization of Empirical Statement I is Empirical Statement II:
Empirical Statement II: "A charge within an electric field is an area where energy and momentum exchange, with the surrounding gravitational space-time, can take place".
Taking into account Empirical Statement II we may notice the following:
In a symmetrical field there is a mutual retraction which leads to a zero absorption of energy or momentum. Inversely, in an asymmetric system, momentum absorption is expected, meaning the development of force and in addition the absorption of gravitational energy. The above mentioned have been confirmed partly through Biefeld –Brown type asymmetric capacitors [47-51] and more clearly through Frolov's asymmetric capacitors [52]. A final answer might be given through an explicit "Over Unity Effect" that has been proposed but not verified through a "Wavy Asymmetric Capacitor with Solid Dielectric and Zero Potential Casing"[38,53].

7.4. Non Locality Effect

The Non Locality Effect is a phenomenon of interaction at a distance without transmission with certain velocity of this interaction through some medium. Such a phenomenon has been experimentally verified by Alen Aspect [54], and it might be explained according to this paper. In fact, according to Eq(55), the "non existing" which is dimensionless has a probability to "exist" everywhere. Therefore*, the distance between two different points of a space-time-matter field has a probability to be zero.* Moreover, the "non existing" might be regarded as active [20]. Thus, an active "non existing" due to zero distance might act everywhere at the same time.

8. Discussion

a. At this point, it would be interesting to compare the present aspect with Putnam's *Minimal Principle of Contradiction*, according to which "There is at least one a priori truth" [55]. According to Statement I, our communication system leads to contradiction. Thus, the question is raised: Can we say that nothing is truth? If so, according to Putnam, there is the truth: "nothing is truth". However, according to Statement I, "nothing can be stated", therefore, it cannot be stated that: "nothing is true", "it is true that nothing is true", "nothing can be stated", " it is true that nothing can be stated" and so on. For the same reason, it cannot be stated that the minimal principle of contradiction is true i.e. it cannot be stated that it is true that *not every statement is true and false.* As it was mentioned, it can neither be stated that the claim of the minimum contradictions is true since this claim includes the arbitrariness deriving from breaking the silence. We may notice that the difference of the present aspect from Putnam's is due to the inner structure of language i.e. to the anterior-posterior axiom.

b. The claim of the minimum contradiction appears during communication. It is a consequence of empirically accepted principles (logic Λ and anterior-posterior axiom) and, therefore, it can be regarded as an empirical principle. Due to the existing contradictions, it implies a non definite description of things. There are already expressed points of view according to which language cannot define exactly the things.

Heracletus says for what can language express: "Λόγος ούτε λέγει ούτε κρύπτει αλλά σημαίνει" (Λόγος neither says nor hides but signifies) [56]. This is compatible with an ontological point of view (in Greek αποφατική άποψη) which is characterized by the notion "συναμφότερον" which means that something is accepted as valid even if it is contradictory [56,57]; the latter has been empirically verified through investigation of texts from ancient times until now [57]. The communication vagueness implied by the claim of the minimum contradictions seems to have similarities with the vagueness of Wittgenstein's language games. However this claim derives on the basis of correctness rules in contrast to Wittgenstein's point of view [58]. In all these cases, the present point of view might reinforce what intuitionally was accepted as valid.

It is noted, according to the claim of the minimum contradictions, that there is a logical and an illogical dimension in our understanding the world. This facilitates us to approach in a logically linked way notions such as freedom, will, faith, intuition e.t.c. which are incompatible, in a first sight, with our original logical way of thinking [2,3].

c. As was mentioned in 7.4 the "non existing" is out of space-time; therefore, it is not characterized by the anterior-posterior axiom; therefore, Statement I cannot apply to it. Thus, the "non existing" seems to be non-contradictory and this might be the reason of the logical part of our thought since it might be regarded as active. However, we cannot approach this notion logically; it could be treated through the claim for minimum contradictions.

d. On the basis of the claim for minimum contradictions a model of stochastic matter space-time was stated. This model derives from the distribution of the relative magnitudes of a flat relativistic space time based on the probability density of the relativistic Schröndinger Equation whose Ψ wave function describes the relative space time magnitudes in a Hypothetical Measuring Field.

Because of its contradictory quality, the nature of the stochastic space-time is chaotic and non-deterministic. Indeed, the geometry of the stochastic space-time is described by the aid of a Ψ wave function which as complex is incomprehensible; in this case, the boundary conditions do not have a real meaning beyond the one we give for simplifying reasons. However, there is a logical structure e.g. the relativistic Schröndinger equation itself. Besides that, there are relations that express an order; for a particle field stochastic space-time, it is arithmetically valid that $\langle E \rangle \langle V \rangle = hc$; this shows a correlation of holistic magnitudes. Moreover, the formula of Eq(90) is compatible with Newton law which with a close approximation presents the visible to us order.

e. We may notice that the simple principles of Aristotle logic which at first sight seemed to be obvious to any one lead in a reasonable way to a more complicated way of thinking which is characterized by contradictions and by a tendency to logic at the same time. This thinking is in agreement with what the experience of communication has revealed and it is powerful enough to have laws of physics derived. Note that the first papers, related to this work and leading to the same results, were based on the requirement for unification of relativity theory with QM [59,60]. According to the way of thinking mentioned there are not privileged areas in nature. Even thought is regarded as a part of physical reality as being uncertain itself; it becomes certain when it refers to entities out of space-time. This way of thinking though logically linked is far from what at a first sight we regard as truth.

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