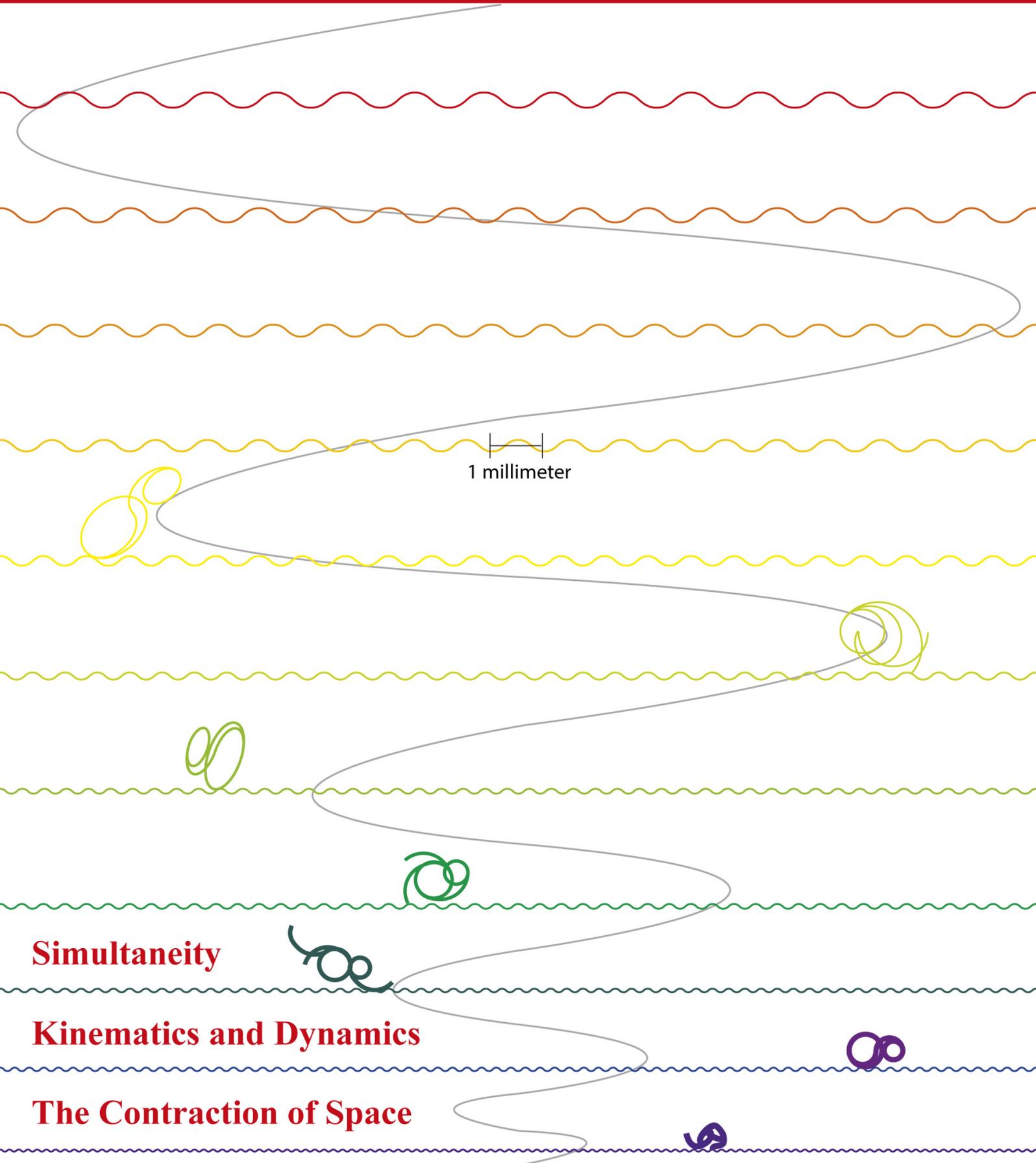


# THE GOLDEN CENTURY

- Science and Scientists -

year I - N. 8



1 millimeter

**Simultaneity**

**Kinematics and Dynamics**

**The Contraction of Space**

## Preface

In this edition of mine I put in particular relief the physical concept of “space”. Also in the cover the accent is on space. In this last one, I tried to present the time and/or space sub-dimensions which, in line with the nonlinear conformation of the electromagnetic radiations’ scale, are quantifiable: (i) using the electromagnetic spectrum the way it was devised by Science and Scientists, and (ii) using the energy levels where a train of waves is forced to leave the electromagnetic network (the space world) to materialize afterwards as a particle (the time world). I recall here to memory that the time and/or space sub-dimensions reach the fully expanded dimension on the 1 millimetre wavelength covering like a snow mantle on the microwaves band the entire surface of the universe. It is clear therefore that when I say the *fully expanded dimension* (our world) I intend all that space compacted by the cycles per second corresponding to the wavelengths going from 1 millimetre up to 299 million 792 thousand 458 metres. This type of space (from 1mm to  $3 \times 10^8$  metres or from 300 GHz to 1 Hz), in line with the theory herein advanced, is compatible with all the living animal beings including *homo sapiens* and with all ponderable matter created all along the endless millennia by train waves which were and are forced to leave the electromagnetic network (the entire band of electromagnetic radiations in their nonlinear conformation). In the same manner, and to make an appropriate comparison, the electron is compatible with a space characterized (by  $10^{-4}$  metres or by  $10^{-12}$  of a second), that is, by a tenth of a millimetre spacelike and by 1 millionth millionth of a second timelike.

I have just said that whenever a train of waves is being interfered with while is expanding in time and/or extending in space, it breaks away from the expanding electromagnetic network in (the space world) to become a particle in (the time world). This is a oneway process since the particle once created it is trapped in the time world in exactly the same way we are. In the cover, I have highlighted the mere fact that particles materialize within the sub-dimensions which above the wavelength of 1 millimetre become part and parcel of the fully expanded dimension.

I would now like to reassure myself that also those few readers not in sintony with science will be able to understand and assimilate pretty well the idea of spatial compactness, of compacted space in a variety of ways by what Science and Scientists call *electromagnetic oscillations* and that I in my work call *electromagnetic filaments*. Let us take for example a common transistor radio. If we rotate one of its knobs technically called *vernier* we can move from one broadcasting station to the other. Each of these, that is; each transmitting radio station possesses its own transmitting frequency characterized by a given number of oscillations per second. The number of these oscillations or filaments comes to create a type of space unique in its gender. This is the space that I am presenting and these are the spaces that as a whole give the sub-dimensions which are populated only by waves (electromagnetic radiations) and not by other worlds like ours where the time and/or space dimension is fully expanded. So, waves and transiting electromagnetic signals occupy the space sub-dimensions and we are, with the appropriate electronic equipment, in a position to capture and receive, as music or any other electromagnetic signal, from the fully expanded dimension - our world.

In closing the preface, I sincerely wish to ask forgiveness to an ever overflowing number of believers of quantum mechanics. Believers the way, only those very few clergymen canonized saints by the pope, can be, I am very sorry, but I was unable to stop myself, Mathematics and logic have demanded it.

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10<sup>th</sup> of April 2018

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## Simultaneity

### *Foreword*

The following three fundamental axioms are the foundation pillars upon which the proposition herein put forward rests.

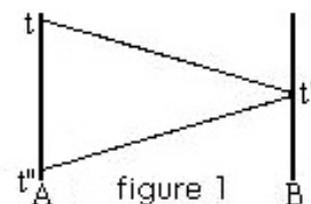
- I. Time and space are physically created by an electromagnetic process of temporal expansion and/or spatial extension to be identified with the existing electromagnetic spectrum.
- II. Time and space have their origin in each and every electromagnetic pointlike point-source in free (optical) space as well as in matter.
- III. Given (I) and (II), it follows that the speed at which time and space are created: (a) is the upper limit and dictates the physical laws in the world we live in (fully expanded time dimension), and (b) it is a function of linear and nonlinear motion in free (optical) space.

In particular, axiom (II) implies that space is permeated by an all-pervasive and permanent substance which I shall herein label *time-fabric*, meaning to say: a permanent non-zero source of energy. From this we may deduce that space is filled by pointlike point-sources which are magnetized by the finite and uniform speed of the expansion and/or extension. These point-sources during their decaying process form all lengths of time and all lengths of space. These lengths are the effective volume containing energy. The entire free (optical) space is, therefore, a universal unsaturated sink with continuous absorption because of the finite and uniform speed of expansion and/or extension.

### *Argument*

In order to come to grips with the relativistic concept of *simultaneity*, I shall begin the argument by saying that when we attempt to define synchronism and simultaneity of spatially separated events, it is of cardinal importance that all thought experiments must comply with the world we live in. In agreement with the above, let us investigate an event at a stationary point A which is simultaneous, the meaning of which is supported by

synchronized clocks, to an event at a stationary point B spatially separated from point A. If a light ray is sent at  $t$  time from point A to reach point B at  $t'$  ( $t^{\text{primed}}$ ) time and to be reflected back to reach point A at  $t''$  ( $t^{\text{doubleprimed}}$ ) time, we may represent these two events with figure 1. If we now assume that time is made throughout the *fully expanded* universe in the same way and that



it is processed at the same speed, we can see that the round trip (2AB) divided by the time ( $t''$  minus  $t$ ) will give us the speed at which the light ray is travelling; that is to say, the speed of light which is the speed at which time and space are processed. This would satisfy both principles of special relativity as well as our second axiom.

Let us now consider once again our two systems A and B separated from each other by 4 light-minutes and ready to send a light ray from a tower whose steps it takes 4 minutes to climb. We can see that if we accept the operator of A to be half-way down from the tower after sending the light ray and the operator of B to be half-way up before receiving the light ray (in a similar tower) as being simultaneous events; we can likewise see that we must make a distinction in kind between the local time “t” of any system, the cosmic time “c” which, mark you, is a finite expanding medium, and the physical concept of simultaneity.

A little earlier I made a reference to simultaneity by synchronized clocks to satisfy the conditions demanded by special relativity. Notwithstanding the climate of existing opinions; *relativity of simultaneity*, in line with the theory herein propounded, signifies that any given space region is classified by its own unit measure of time. This is not an apparent change, as some scientific literature wants us to believe, this is a real change and it implies the existence of a real physical effect. In other words, I am saying that a space length possesses a physical property given to it by the process of space extension. Once that we take into account the time difference between two given space regions, we will have no problem in establishing absolute simultaneity. Indeed, our objective is the simultaneity of events, not the simultaneity of times (e.g.: hours, minutes, seconds).

The read-out of synchronized clocks, even though has been part of our physical laws for a long time, it has nothing to do with the simultaneity of spatially separated events. The problem seems to be one of interpretation. It appears that the confusion of thought is due to a misuse of language. To come away from such a confusion, we must conduct a more careful analysis of language, of any language. More precisely, words such as contemporaneous, synchronous, and simultaneous define what is done or what happens at the same time; that is, at the same instant of existence which by hypothesis it has nothing to do with clock-time.

I ought to further qualify the above statement. If I phone someone in Great Britain from my home in Italy; at the end of our conversation, chances are we will both say “ciao” at the same time (not clock-time); that is, we utter the same word simultaneously. The fact that we are separated by a spatial distance and therefore by a temporal interval does not destroy the simultaneity of those two events. The same thing can be said on a cosmic scale because of the natural time-fall. In brief, the relation 1 second of time = 300 million metres of space makes time a function of spatial motion which means that a body in motion with respect to a permanent non-zero source of energy, in terms of pure definition, is itself a clock. For example, if we have infinitely many clocks along a spatial path, they might separate two given events, but do not; I repeat, do not interfere with their simultaneity if these events have been performed simultaneously. Rejecting simultaneity of spatially separated events, means denying the physical character of time existing all along the spatial path separating these events.

Let me now elaborate on the second principle of special relativity originally put in the following terms: *any ray of light moves in the stationary system of coordinates with the determined speed c, whether the ray be emitted by a stationary or by a moving body*. This is generally understood to mean that the speed of light is the same in all frames of reference. From this assumption it follows that  $c+v=c$ , and  $c-v=c$ . According to these expressions a moving observer would experience no change in time, hence no change in frequency, and no red or blu shift which, according to astronomical observations, is supposed to exist. It is my view that the equation  $c$  plus or minus  $v = c$  is indeterminate and its significance needs to be specified further. In a while, I shall try

to clear the meaning of this paradoxical expression, here I remind the reader that the physical concept of *length* is common to time and space and this, as we shall see, will explain the afore-said paradox. In the meantime, let us look at some elementary mathematics coming from special relativity itself.

Let us now imagine a spherical system S at rest and a similar spherical system S' (S<sup>primed</sup>) moving with velocity v in the x direction relative to S. The equation of the surface enforceable from within, in either system is:

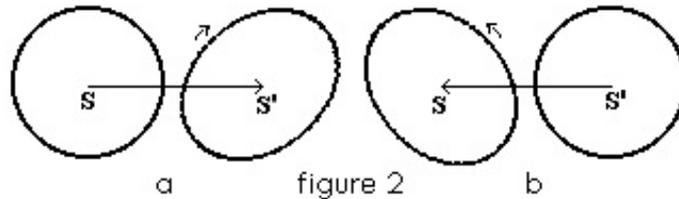
$$x^2 + y^2 + z^2 = (ct)^2$$

$$x'^2 + y'^2 + z'^2 = (ct')^2$$

and we shall find that the same surface of radius ct when viewed from without is given by:

$$\frac{x^2}{\sqrt{1 - \frac{v^2}{c^2}}} + y^2 + z^2 = (ct)^2$$

where the radius ct is given as being common to both inertial systems. Thus, our moving spherical system when viewed from the stationary system S acquires the form of an ellipsoid of revolution, or spheroid, see figure 2a. These conditions are reciprocal when viewed from the moving system S', as clearly shown in figure 2b.



We can see here that  $c \pm v$  acquires significance in particular whenever the concept of length is being enforced. This *length* affects the relationship between time and space in the sense that both are made by the length of the wave, and both are made by the same process; and, incidentally, if we interfere with one by mathematical necessity we are interfering with the other. Linear velocity as intended in the above transformation operates directly over space, angular velocity as seen in centrifugal forces operates over time and the gravitational potential whose significance is that of contracting the length: when it is applied locally operates over time, and when is applied over long distances operates over space. For example, from figure 2 it is quite clear that the distortion, visual or otherwise, between the two systems is brought about by the *physical property*, of the process for the creation of time and/or space, embedded in the space distance between the two systems.

At this point in time, if we give for granted that the *temporal* surface of space is renewing itself at each and every second of time; it will be clear that while the coordinates of a geometric space can be mathematically primed (transformed) without loss of generality, the same transformation whenever applied to free (optical) space makes no sense unless we take into consideration that all along the spatial path we are dealing with a permanent non-zero source of energy. In point of fact, we are in no position to generalize and conclude, with what it appears to be a logical conclusion, that a system of coordinates in free (optical) space can be transformed from a stationary frame to a moving frame and/or vice versa. For example, any transformation from

our time dimension (stationary frame) to a new time dimension (moving frame) is a one way affair since the new time dimension proper of the moving frame is characterized by a new and shorter unit measure of time and because of it our physical laws, as we know them, are no longer valid in that frame.

I shall here recall how experimental evidence shows that when a particle materializes from a time sub-dimension it carries with it its proper-mass and its life-time; meaning, the time of any particle is shorter than the time of the *observer* watching it. And since, a time sub-dimension is the equivalent of a moving frame (the velocity shortens the length); it is clear that we *commu-nicate* with a particle at the full speed of light, and that the particle *communicates* with us at the speed of light proper of its time sub-dimension or, what comes to the same thing, at the speed of light contracted by the transformation ratio.

I am going to take a little digression to mention what I have always asserted in all my work, I said: *the atom holds an electromagnetic spectrum in miniature*. Similarly, we must recall to mind that the sub-dimensions of time and/or space materialize all along a space path from whose origin initializes the process of creation. The origin, which is a monopole generated by the expanding universe, receives a magnetic charge whose energy (299 millions 792 thousands 458 cycles per second) is dictated by the expanding speed. The monopole at the instant of its physical creation, in obedience to Faraday's law, induces an electric field and the two together will then make an electromagnetic chain whose energy taken at the origin is spent to lengthen the wave-length in time (virtual length) and in space (real length) long 299 millions 792 thousands 458 metres. The space path is descending for the energy and ascending for the wavelength and therefore the low frequencies with wavelengths above one millimetre will be created in the conclusive stage of the creation process. The last cycle does not have the necessary energy to induce an additional electric field and it dampens itself expanding in time to contribute to the universe's old age and extending in space to contribute to its boundless dimension.

### *Conclusion*

I come to an end now recalling to memory that by accepting time and space as products of nature will disappear as if by magic all relativity and quantum mechanics' paradoxes. And, obviously, there will no longer be the renormalizations which, all in all, have become a bit too many. All of it is possible because I am describing nature which in the final analysis it is the task of Science and Scientists.

Back on track for the closing. With regard to a transformation within our fully expanded dimension; a physical body can never be transported through free (optical) space without losing its shape and/or dynamic properties; never mind a physical body, not even an electromagnetic wave can do it. The wave, in fact, in displaying the redshift shows clearly that it can be transformed only if we account for the lapse of time, only then, the wavelength is the same both at the source and at the receiving end.

To close the circle, I shall say that the acceptance and reinstatement of absolute simultaneity is a foregone conclusion. I say this because even the most loyal proponents of relativity will tell you that the *relativity of simultaneity* would fall apart if the speed of light were not the same in both the stationary and the moving inertial frame.

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21<sup>st</sup> of April 2018

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## Kinematics and Dynamics

### *Foreword*

The following three fundamental axioms are the foundation pillars upon which the proposition herein put forward rests.

- I. Time and space are physically created by an electromagnetic process of temporal expansion and/or spatial extension to be identified with the existing electromagnetic spectrum.
- II. Time and space have their origin in each and every electromagnetic pointlike point-source in free (optical) space as well as in matter.
- III. Given (I) and (II), it follows that the speed at which time and space are created: (a) is the upper limit and dictates the physical laws in the world we live in (fully expanded time dimension), and (b) it is a function of linear and nonlinear motion in free (optical) space.

In particular, axiom (II) implies that space is permeated by an all-pervasive and permanent substance which I shall herein label *time-fabric*, meaning to say: a permanent non-zero source of energy. From this we may deduce that space is filled by pointlike point-sources which are magnetized by the finite and uniform speed of the expansion and/or extension. These point-sources during their decaying process form all lengths of time and all lengths of space. These lengths are the effective volume containing energy. The entire free (optical) space is, therefore, a universal unsaturated sink with continuous absorption because of the finite and uniform speed of expansion and/or extension.

### *Argument*

We all have learned from special relativity how the idea of time dilation and length contraction is of necessity connected to the relativistic concept of simultaneity. In particular, we have come to appreciate the concept of length of a stationary and of a moving object recognizing in the process that length itself is a function of velocity. By deduction, we came to realize as well that the unit measure of time, or length of time must be a function of its velocity. With a view to throw more light on the physical concept of length, I shall now turn my attention to the analysis of some kinematics and dynamics relations of special relativity and in particular review the time dilation and length contraction with a fresh approach.

To start with then, let some clocks rest on inertial frames  $S$ ,  $S'$  ( $S^{\text{primed}}$ ) located along a straight line in the direction of the axis of space. In order to record from without the time of an event taking place in either frame and before applying the Lorentz transformation  $(1 - v^2/c^2)^{1/2}$ ; an inertial observer must ascertain that the clocks in  $S$  are all synchronous within  $S$  and that the clocks in  $S'$  are all synchronous within  $S'$ . That is, each inertial frame (no matter the size) must have its *proper-time* that can then be recorded as relativistic time by any other inertial frame. For example, if I define the size of an inertial frame to be an electromagnetic point-source (I am at liberty to do so), I would then come to realize that there is no need for synchronized clocks

because the clock, so to speak, is one and the time is unique to that frame. If I were to consider two such inertial frames one adjacent to the other however, I would find that the time-fall in-between frames would be in the order of  $6.67 \times 10^{-9}$  cycles per second; that is, each inertial frame would be moving at the speed of light and its slope would then be  $1/c$ , or  $3.335 \times 10^{-9}$ .

And once again, if we had two inertial frames some distance apart from each other; one of the two inertial observers could record the time of an event in the other by: (i) using the Lorentz transformation of course, or (ii) mentally fill the geodesic line separating the two inertial frames with infinitely many clocks. In the latter case, in line with our significant 2<sup>nd</sup> axiom, the *clocks* were put there by mother nature; and are separated by a length of space in time which means that *we can not and must not* put them together to form an artificial inertial frame for our own benefit; we have no right to arbitrarily assign simultaneity by synchronized clocks to inertial frames of indefinite size.

If we accept, as per our 2<sup>nd</sup> axiom, that time is made in the whole of space; and that from here to the Sun there is a distance of 149 million kilometres or, what comes to the same thing, a time difference of 8 minutes and 17 seconds; we must agree that time does not accrue at a given instant of the hour or at a given hour of the day; and it does not accrue suddenly at a certain boundary either. From here to the Sun or anywhere else for that matter, time is processed all along the distance by local electromagnetic point-sources. Time is a local process for local consumption. Nature is endowed with *motherly largesse* and unlike social institutions it makes sure the interests accrue by every millionth millionth of a second of time, and by every millionth millionth of a millimetre of space. Seen in this way, the simultaneity by synchronized clocks in any given inertial frame is not authoritative. More momentous still, the relativistic concept of *clock* it has no significance whatsoever and it is therefore inadmissible.

At this point, I would like to stress that the speed of light “c”; that is, the speed at which time and/or space are processed, while it is the same for all reference frames in the world we live in (fully expanded time dimension); it must, of necessity, be dependent upon spatial motion. I shall try to be brief and to the point. A moving frame of reference undergoes length contraction and time dilation and therefore, it belongs to a smaller world where the unit measure of time is shorter. Over and above, a moving frame in subtracting a given space length from the total *space unit measure* (300 million metres) must subtract also a time duration from the total *time unit measure* (1 second) so that the ratio 1 second = 300 million metres is maintained in the new frame. The moving frame, we may say, finds itself in a world where the unit measure of time is shorter. The faster the moving frame the shorter the unit measure of time, or better still: the more space the less time per unit length. This is tantamount to saying that: (a) from a stationary point of view the world is made of time, (b) from a mobile point of view the world is made mostly of time and a tiny, a very tiny bit of space, and (c) from a ray of light point of view the world is made of space.

To my reader unfamiliar with the facts, I just want to say that unless the relation 1 second of time equals 300 million metres of space is maintained, we are a long way away from depicting nature. The following is a befitting example to help understand what I am talking about. Now then, a commercial airline pilot who has clocked ten thousand hours of flying time at an average speed of 700 kilometres per hour for a total of 7 million kilometres flying time is 23.33 seconds biologically younger since his age is made up of mostly time, yes; but, with the addition, or if you like with the subtraction, of a little bit of space.

According to the theory herein proposed, the time dilation shortens the unit measure of time and therefore it shortens the process for the making of time and/or space as well. It follows that

whenever a stationary system is transformed to a moving system, the physical laws are not covariant (do not co-vary); that is, the system undergoing transformation does not retain the same form in those frames characterized by motion which, as we have just seen, not just shrink, but belong to a smaller world whose size is dictated by the transformation ratio. The higher is the velocity “ $v$ ” of this ratio the smaller will become the new world and the farther apart our physical laws will stand from the physical laws of the moving frame.

If one takes into consideration the whole picture, it is quite clear that the length contraction and the time dilation are caused by a projection of simultaneity between the stationary and the moving inertial frames. This projection, moreover, must be taken into account in the reciprocal transformation. I will now readily and diligently elucidate the point. The reciprocal transformation cannot have as a starting point the same speed of light “ $c$ ”; that is, the moving frame is characterized by a shorter unit measure of time hence by a shorter process for the creation of time and/or space. In brief, a transformation has the effect of contracting a given system, or to put it differently, a moving system is by definition a contracted system where everything must be equally contracted according to the contracting ratio used, and where the speed of light “ $c$ ”, as we know it, no longer applies.

The pretty story of the proverbial spacecrafts moving in opposite directions and sending flashes of light to each other *proving* the invariance of the speed of light may have made some sense at the beginning of last century when space was believed to be empty and devoid of physical properties and the world was all taken by an exciting scientific awakening. It should make no sense now when *resident* energy in free (optical) space is beyond any contention and the world has become more demanding and more selective.

I shall here remind the reader how experimental evidence shows that when a particle materializes from a time sub-dimension it carries with it its *proper-mass* and its *life-time*; meaning, the time of any particle is shorter than the time of the observer watching it. And since, a time sub-dimension is the equivalent of a moving frame (the velocity shortens the length); it is clear that we *communicate* with a particle at the full speed of light, and that the particle *communicates* with us at the speed of light proper of its time sub-dimension or, what comes to the same thing, at the speed of light contracted by the transformation ratio. I shall here recall as well what I have asserted in all my work, I said: *the atom holds an electromagnetic spectrum in miniature*. In thinking it over and with reference to empirical experience and to the many phenomena observable in the world of the very small, the time has come to accept with grace the existence of this electromagnetic spectrum in miniature inside the atom.

To complement the above, I must point out that whenever the Lorentz transformations are rotated in a Minkowski flat space, the speed of light retains the same speed in all inertial frames whereas the *length proper* of moving frames becomes a function of the imaginary velocity “ $v$ ”. An incoherent situation? Certainly! It cannot be anything else. And it is of incoherence that we must talk about, because if time and space are made of *lengths* and if the speed of light is a transverse physical property of the electromagnetic process for the creation of time and space; then, we cannot accept a relativistic world where the only absolute is the speed of light which is itself made of *lengths*. The absolute time of Newton was, for a long time, an article of faith, and to declare false this article, Einstein used the constancy of the speed of light to prove the variability of time and space; what a contradiction in terms, what a mess!

As a final exercise, and in order to dispel any residual doubts, let us imagine that we have a spacecraft accelerating in free space and equipped with two atomic clocks located one at the stern and the other at the prow. We shall find that at relativistic velocities the pilot at the prow

will experience the rear clock going faster than his own while an inertial observer at the stern will record the prow's clock going slower than his own. The difference in the reading of either clock will increase proportionally to the increasing velocity of the spacecraft.

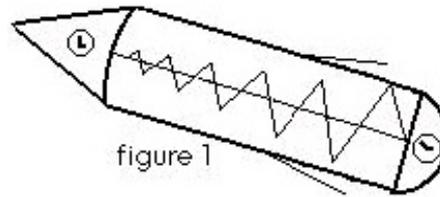


figure 1

This situation can be understood if we pause for a moment to consider that the vibrations of the caesium atoms which run our atomic clocks will have to cover an ever increasing distance to catch up with the receding prow as seen from the rear and will have to cover an ever decreasing distance to reach the approaching stern as seen from the prow's view-point of the spacecraft. In brief, the faster the spacecraft moves through free (optical) space the longer the distance to cover for the vibrations to travel from stern to prow and obviously the shorter the distance for the vibrations to travel from prow to stern.

Here then, we have a clear explanation of the so much talked about *time dilation*; and a truly appropriate explanation for all that since the vibrations, or better still the lengths of space in between, are the only things needed to create time, to create all lengths of time. As we have just seen, when we run against the speed of light, we inexorably enter another time dimension, a dimension where the unit measure of time is shorter than ours; a time dimension where the wavelengths all along the electromagnetic spectrum will become ever so shorter, hence ever so shorter will become the unit measure of time.

Having pointed out the time dilation physical significance, let us now see its mathematical quantities and how these can be expanded or contracted by simply widening or narrowing the wavelength which is the unit measure of time. For example, let our spacecraft move once again at an imaginary relativistic velocity; then, the clock  $t'$  located at the stern can be, at any instant of time, considered at rest relative to the clock  $t$  located at the prow (both of which have been synchronized at the origin). Further, let  $y=y'$  and  $z=z'$  and let the spacecraft move along the  $x$ -axis of space, we may then put the whole thing in the following mathematical form:

$$x = vt \quad .1$$

with

$$t' = \frac{1}{\sqrt{1-v^2/c^2}} \left( \frac{t - vx}{c^2} \right) \quad .2$$

and

$$t = \frac{1}{\sqrt{1-v^2/c^2}} \left( \frac{t' - vx'}{c^2} \right) \quad .3$$

where we can see that the time marked by the clock  $t'$  (viewed from the stern of the spacecraft) is slower than the time  $t$  at the prow. I note that, contrary to the thought experiment exercised at the beginning of last century; I am not using mechanical clocks, I am not treating time as an interloper. I am treating time as a local process and using it locally as I move along the  $x$ -axis of space. In brief, the transition between two ground state levels around the caesium-133 nucleus and therefore the electromagnetic vibrations of the caesium atom of the atomic clocks in use will increase proportionally with the increment of the velocity of the spacecraft. At a given relativistic velocity this increment becomes very significant even within the very short length

of the spacecraft. The atomic frequency is then no longer 9.192.631.770 cycles per second, but higher while the unit measure of time (wavelength) is shorter, and shorter still at the prow. At this point, it is imperative to advance yet another proposition. I shall argue here that the group of the Lorentz transformations whose synthesis is to be found in the works of Maxwell, Larmour, Fitzgerald, Lorentz himself, Poincaré, and Einstein, were used in special relativity with the intent to define a particular space region, to define a correspondence frame. Something similar to a time zone where simultaneity by synchronized clocks is selected by mutual agreement; and where the absolute frame of reference hence the universal time so dear to Poincaré and Lorentz have lost their significance.

Time is not like that at all, time has no common origin. The way things stand, time is not even common to its nearest inertial frame located at an incredibly short distance of  $6.67 \times 10^{-36}$  millionth millionth of a millimetre millionth millionth of a second. In order to specialize my discourse, I shall forthwith recall the Lorentz transformation in the form in which the radical is more evident to a layperson, viz.:

$$\sqrt{1 - v^2/c^2}$$

to find myself in front of a physical contraction whose meaning is not appropriately rendered by a linear operation, and to note that the adoption of the speed of light with its implied meaning of “distance runner” is not conveying what is happening in the physical action described by the equation. Yet, this transformation is a most wonderful piece of machinery. It is the conversion factor upon which special relativity is hinged. It is believed to be the vehicle with which a stationary world and a world in motion can relate to each other; and it is also a much used tool whose mathematical linearity is not reflected in its physical application. In the course of my investigations, I have paid much attention to the relationship, or I should say to the ratio,  $v/c$  and I have come to the dismaying conclusion that the velocity “ $v$ ” in the Lorentz group of transformations is no velocity at all.

### *Conclusion*

The propagation speed of electromagnetic radiations (including the speed of light) it takes place in the linear field. Any electromagnetic signal or disturbance moves and it can only move along a frequency possessing the same number of cycles per second or, what comes to the same thing, along a space possessing the same electromagnetic compactness. All electromagnetic radiations have obviously the same speed in their nonlinear conformation during their process of expansion in time and/or extension in space.

I would also like to put in evidence that in the light of this rather interesting argument and to end my discourse, I have no choice but consign to oblivion an imposition exercised by Einstein in the name of his special relativity and at present a standing convention for which: (i) the distance in-between coordinate points in whatever inertial frame is independent from time, and (ii) clocks at each coordinate point within whatever inertial frame must be synchronized in such a manner to constitute what it would then become a common “ $t$ ” time to all coordinate labels.

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## The Contraction of Space

### *Background*

In my previous issue of this magazine, at the end of July, I informed the reader that relativity would give me the possibility of presenting for the first time in the history of science space in its pristine form, space in mathematical form, free (optical) space readily quantifiable, all free (optical) space sub-dimensions quantifiable.

In my two preceding arguments I have been able to put side by side special relativity on one side and on the other the way the theory herein advanced foresees some aspects of our world clashing badly in the process with the ongoing physical laws. All of this gives me now the possibility to amplify my view point and introduce, as I have promised, free (optical) space in the form nature wanted to labouriously create and in such details which, as the reader may pleasantly ascertain, are quantifiable on demand.

Everything is new and everything is of great import to Science and Scientists alike. I am not a “copy and paste” man. I am an incorrigible disciple of Galileo and Sir Isaac Newton. I prefer the old science called philosophy and trying to describe nature and I dislike this sort of modern philosophy which is pompously called science although pretty far from describing nature.

### *Argument*

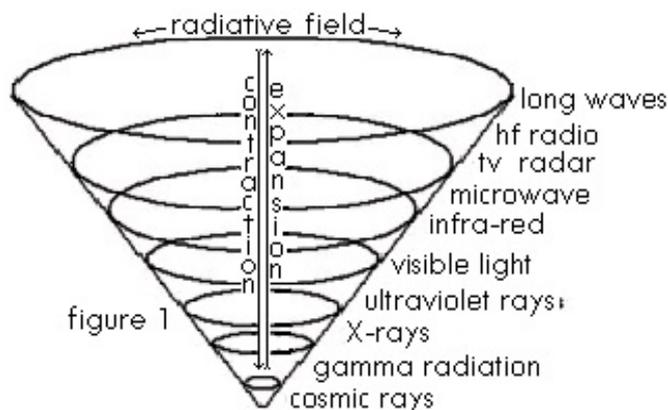
I shall begin this section by recalling to mind how the American Theodore Maiman in 1960 came up with one of the most useful inventions of last century; namely, the laser. I am going to need the physical concept behind the laser in support of my forthcoming argument. I am, therefore, taking my readers along so that we all can get acquainted briefly and schematically with Maiman's truly extraordinary invention.

If we stare at a red object we can only see it red; no matter how intensely we stare at it we can see nothing else but a red object. An ordinary household torch, no matter how powerful; if it had a vision of its own, would not do any better than you and I. If this torch were a laser (light amplification by stimulated emission of radiation), however, things would change a bit, quite a bit. In point of fact, the laser can and does intensify a beam of light so much so that the observed object, from the point of view of the laser, will change from red to green, to violet and all the colours in between; and much, much more. Broadly speaking the human eye can see, by utilizing a medium known as the “visible spectrum” which lies between the wavelengths of 7000 Ångstrom, or 0.7 millionth of a metre (when we see a red object) and 4000 Ångstrom, or 0.4 millionth of a metre (when we see a violet object).

In reality, a laser can produce a powerful and coherent beam of electromagnetic radiation in the regions of the electromagnetic spectrum ranging from infrared light, visible spectrum, to ultraviolet rays. A light beam has of course the same direction, phase, frequency, and sense. These waves, moreover, can be intensified, or amplified so that they can move directly along

a wide band of wavelengths. The intensity, or amplification can be readily adjusted in such a way that the region of free space occupied by the beam of light, due to the very bright light, or irradiance itself, becomes ionized; that is, the atoms in it maintain a high energy charged state. If we were allowed, for example, to put in it the antenna of a receiving apparatus, we would find that we could only receive radio signals in the wavelengths dictated by the laser's amplification. Actually, in such a region of free space all the other time sub-dimensions, or wavelengths have been pushed aside by the laser beam.

Much the same happens, for example, in supermarkets with the small lasers used to scan the bar-code of our groceries. These lasers "see" the objects through a different wavelength than we do; more precisely, they are made to employ wavelengths shorter than the human eye can see. This is particularly so in the field of research where powerful lasers are employed. In such cases, a frequency oscillator, while going through stages of pre-amplification and amplification, can convert reasonably long wavelengths (in the order of the infrared light) and hit the target as a light beam oscillating at very high frequencies (upper band of the ultraviolet rays). In other words, making use of the frequency amplification, the laser beam has the property to intensify a thousand times over, and over again its original input frequency. This intensification process implies of course that the wavelengths, hence the lengths of space occupied by the laser beam are being shortened, or better still contracted, while the frequencies hence the cycles oscillating at each second of time within the beam of laser waves are amplified or better still increase their number.



As we may well see from figure 1 the contraction has the same orientation but sense inverse to the expansion. With the expansion we have amplification of amplitude (we go up from cosmic rays to long radio waves), while with contraction we have the frequency amplification (we go down from long radio waves to cosmic rays). The beam of laser waves is operative from infrared rays down to ultraviolet rays.

I shall recall here how, all along our long and difficult discourse, we have learned that the higher the frequency, or intensity the deeper the radiation can penetrate into matter; and the deeper it penetrates the stronger becomes the interference with the atomic structure of matter itself. In point of fact, modern lasers can destroy matter altogether. Some half a century ago or so lasers, even though cumbersome and expensive, were already able to reduce matter, for a very short length of time, to a state of plasma; something very similar to what it is believed to exist in the core of a star like our sun. As things stand, we must accept the evidence that a light beam generated by a laser can effectively interfere with the atomic structure of an object. To put it in a different way, the atomic structure of an object can be dismantled at will whenever the said object happens to be, or it is put by purpose, in the field occupied by a laser beam.

Following this line of thought and acknowledging unquestionably the reality that the speed of light can travel around our planet seven and half times in one second, one is tempted to think that a theoretical physicist of Maiman's calibre in trying to formulate an equation involving the imaginary velocity of a spacecraft would have almost at once realized that he was backing the wrong horse. He would have readily dismissed the idea of accelerating a spacecraft at relativistic velocities. Maiman would have done so because in actual fact he did the other feasible thing; Maiman accelerated the electromagnetic field, he contracted free (optical) space.

We have now in front of our very eyes a representation somewhat different from the one offered by Einstein in his special relativity where an imaginary spacecraft travelling at an imaginary relativistic velocity was shrinking and staying in the stationary field (our world). We have instead a real moving electromagnetic field with a real stationary object in it; when this field moves at a relativistic velocity and it shrinks enough as to interfere with the inter-atomic particles of the stationary object we see the object itself disintegrate. We can see clearly now, we can admire fascinated and with our mind at ease the governing laws of existence and “becoming”, the laws offering a portrait of nature; and it is with sheer delight and good grace that we accept the meaning of the Lorentz transformation, that is to say:

$$\sqrt{1 - v^2/c^2}$$

and its obvious indeed physical contraction therein. The Lorentz transformation will, then, hold for all physics.

With the intent to clarify some points of the ongoing argument, I shall now pass some comments. It seems clear to me, and I kindly entreat my readers to take my words with a benevolent attitude, that the Lorentz transformation is a device unintentionally designed to quantify space at will: from infinity ( $c-v=c$ ) to the singularity of a black hole ( $c-v=0$ ). The Lorentz transformation has nothing to do with the utopian velocity of an imaginary spacecraft set in motion against the expanding and/or extending process which was called *speed of light*. The Lorentz transformation is a mathematical tool unwittingly manipulated to take the world we live in where time has a set length (fully expanded dimension) and recast it into a smaller world where the finished product, so to speak, has a shorter length (time and/or space sub-dimension). The faster the velocity  $v$ , the shorter the scale of the electromagnetic spectrum and consequently the smaller the time and/or space dimension of this new hypothetical world.

Indeed, by applying the Lorentz transformation, we are simply trying to negotiate from our dimension a world whose time dimension has stopped short somewhere along the electromagnetic spectrum to satisfy the whim of the unknowing manipulator. With a little originality and a lot of imagination, we can even see a rigid rod getting shorter and shorter as we keep on descending towards the cosmic rays range of frequencies. The truth unfortunately is another matter. Never mind the shortening of a rigid rod, it does not even come to mind; experimental evidence shows that not even a particle can make its next time and/or space sub-dimension without annihilating itself in the transition process.

What I am arguing here with reasons is: (i) the physical impossibility of running at relativistic velocities, and (ii) the recognition of a non-linear operation performed by a linear group of transformations. The second point will emerge quite clearly from the overall context of this work. As for the velocity limit, the only thing I can say in order to sustain my view is that an object flying around our planet at a height of say 9000 metres with a flying velocity of 1 tenth of 1 percent of the speed of light would be passing overhead every 2 minutes and 13 seconds. As any aeronautical engineer will tell you, much before this velocity is reached, the strain

produced on the elastic limits of all structures of the object by the compressive stress (length contraction) will have already caused the object to disintegrate.

The reader, willy-nilly, must agree with me that at this point of our discourse, we have come to find ourselves at the crossroads. We can: (a) let the transformation group operate in a non-linear field and ignore all the existing paradoxes, or (b) recognize the nonlinear field of a linear operator and find out that both 1<sup>st</sup> and 2<sup>nd</sup> principle of special relativity, that is:

I “the analytical form of physical laws is the same in all inertial reference systems”, and  
II “the speed of light is the same whether be emitted by a stationary or by a moving system”.  
are not applicable, and they were never applicable. Their validity can only subsist if time is tied to the wrist or hangs from a wall. The theory herein propounded sustains that not only time, but space as well are the legitimate result of an electromagnetic process of expansion in time and extension in space put there by mother nature.

Keeping in mind the Lorentz transformation, let us now think with the fertile mind of a theoretical physicist at a time when the only flying things in the sky were kites and, if one could read (there was no radio or television), he/she would have known that there were flying objects called airships. Einstein, armed with a theoretical mind and a fervid imagination, envisaged an imaginary spacecraft to prove a new theory. He gave the spacecraft an imaginary velocity and by setting this velocity side by side to the real speed of light he was able to reach those conclusions which have changed our way of thinking in theoretical physics ever since. To be able to associate the speed of light to the time dimension it was then, and it is now, one of the grandest achievements in the field of science. In order to prove his theory right however, Einstein had to compromise. Even though the imaginary velocity of the spacecraft was given a physical status, it was then and it is today an imaginary velocity. The transformation in question is, therefore, conceptually right but physically wrong. A century after its formulation, the so-called Lorentz transformation is still theoretical, with no practical application in the world we live in.

While emphasizing that the equation in question is valid and useful in the world of the very small where we observe particles running at almost the speed of light and, mark you, lasting no longer than 1 millionth of a second before disintegrating; we also acknowledge that Einstein was right to do what he did. The relativistic velocity of the spacecraft, however, is enforceable if, and only if, the spacecraft stays in the world we live in (will not disintegrate).

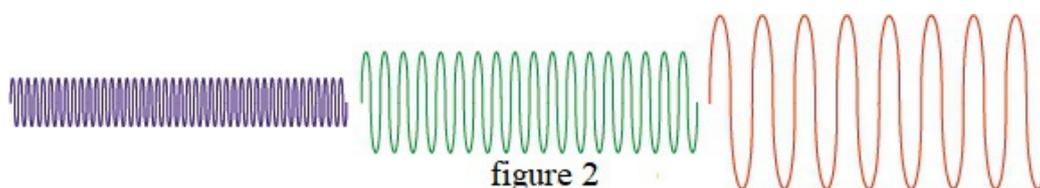
To conclude, in the light of the above facts, I think I have highlighted the ambiguous situation in which special relativity found itself. I have also put the accent on the role assigned to the Lorentz transformation which for symmetry reasons and for mathematical elegance does not reflect, and it cannot reflect, the world in which we live whose main characteristic is put in relief by our second axiom; that is, time is made in each and every infinitely small point in free (optical) space as well as in matter which in turn implies an absolute frame of reference and, therefore, the asymmetry of the electromagnetic field.

Yes, that is right, I said the magic word: asymmetry of the electromagnetic field. This gives me the privilege to assert that the time and/or space sub-dimensions exist in nature and they are the underlying part of the fully expanded dimension. And the whole, as I said in many other occasions, it is constituted by electromagnetic radiations in their nonlinear conformation also themselves integral part of nature.

So, I am talking about all that Science and Scientists alike call *space* and that in my work I call *free (optical) space*. I am talking of a strongly asymmetric world all along its sub-dimensions which are characterized by spatial descending energetic compactness and by temporal ascending

wavelength. A strongly asymmetric world also along all that I call *fully expanded dimension* which includes a space whose compactness cover from 300 GHz to 1 Hz or if it is preferred from 1 millimetre up to 300 million metres.

In the cover I have given a hint, with my speech bubbles, of what I really intend to say when I speak of electromagnetic compactness. Here I shall instead put a bit more into focus the laborious work the filaments of electromagnetic radiations are carrying out at each and every second of time during the evolutive process while expanding in time and/or extending in space.



In figure 2 we may see three types of space: the high-range compacted space giving us high energy space, the middle-range compacted space giving us the medium energy space and the low-range compacted space giving us the low energy space. These three types of space are only indicative since, as the mathematically mature reader has already understood, space in itself changes its physical compactness at each and every proper energetic level.

The space sub-dimensions are not populated by men and machines, as some visionary men of science wanted us to believe. The space sub-dimensions are the legitimate *habitat* of electromagnetic waves and of possible transiting electromagnetic signals. There are also occasional interference or disturbances not necessarily electromagnetic which in disintegrating the filaments of a discrete number of waves cause the materialization of one or more particles. And this would also explains not only why high energy particles are so fast, but it tells Science and Scientists alike for the very first time the why and the wherefore they are. electromagnetically speaking, so heavy. Electromagnetic radiations constitute a world, the way it is, mass-less and matter-less. A world whose atomicity is in the future. A world where the oscillating filaments are creating from time immemorial 300 million positive waves and an equal number of negative waves at each tick of the clock; that's right, for each second of time with such precision and determination to defy our wildest imagination.

Neither the world of free (optical) space where all is primeval, pristine nor the temporal world where there may be some leeway, can forgo the incongruence of the standing *uncertainty principle*. The laborious filaments which are the fundamental structure of electromagnetic radiations, with their infallibility that continue to renovate itself at each instant of time, together with the atom, the milestone of the universe, with its absolute precision through the billions and billions of years obtained (as atomic clock) by the electronic oscillations of the atom of stronzio, cannot and mustn't be put in the same heap with the uncertainty principle and the wave-particle duality. The filaments of radiations and the atom belong to pure science, the uncertainty principle and the wave-particle duality are nowadays only small change in odor of philosophy.

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