

THE GOLDEN CENTURY

- Science and Scientists -

YEAR I - N. 1



LINEAR FIELD AND NONLINEAR FIELD

MATHEMATICAL AND GEOMETRICAL UNDERPINNING

Preface

Between a humble and modest beginning and a tailpiece to crown an innovative theory yes, but real, concrete, and easily assessable; there are and will follow some twenty topics with about two thousand words each. If the reader wants to stay with me, I will be very pleased to collaborate and send him all the papers that shall follow.

For the benefit of the reader, I have herewith listed some quite necessary basic considerations.

The theory here advanced places time and space into nature. If the reader wants to mentally toy with the idea, he will see with great surprise a functional theory, will see that everything matches, that the paradoxes are no longer there, that the renormalizations are no longer needed, and more, much more.

A theory that will help us to reconstruct and unify the basic notions of Relativity and Quantum Mechanics which, as it is well known, have been and are at present incompatible. A theory without which one cannot speak of time and space.

A theory that gives the parameters time and space body, that gives time and space a physical structure.

A theory showing beyond any doubt how the frightening concept of nonlocality was never there.

It is my view, amply supported by my numerous arguments, that when the three fundamental axioms of the theory herein proposed will be part of our laws of physics; Quantum Mechanics, in its new suit of armour and free from the uncertainty principle burden and from the wave-particle duality burden, will become a creative body of knowledge and it can take the human race to technological heights never dreamed before.

In today's Science: theories, laws, principles, axioms, postulates, and all the rest must integrate, and with them blend, time and space as products of nature created by a physical process to be identified with the electromagnetic spectrum which represents electromagnetic radiations in their nonlinear conformation.

There you have it: I just said the magic words. There shouldn't be any doubt in anybody's mind that Electromagnetic Radiations are a product of Nature, they exist within space, within the whole of space. Over and above, they have been found to be "linear", all of them linear. In other words, all components making up the universe used to be observable, used to be seen, at short or long distances, only through the visible spectrum; today they may be observed throughout the entire range of electromagnetic radiations: gamma rays, X-rays, infrared, macrowaves, radio waves, and all the rest.

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Linear field and nonlinear field

Introduction

My task here is to talk about physical linearity and nonlinearity. To bring it to good fruition and to arouse in all of you some interest, I have chosen to set up the subject matter keeping in the background the much-discussed expansion of the universe with its endemic evils. I made this choice for two reasons, ① for the incontrovertible fact that electromagnetic radiations (represented by the electromagnetic spectrum), in their nonlinear conformation, that is, in the direction of expansion, exist in nature locally as well as at any cosmological distance visited by our astronomical observatories; and ② thanks to radioastronomy, or perhaps I should say to radiocosmology, we also know that not only the visible spectrum, but the entire electromagnetic spectrum has linear functions, that is: lends itself as a medium for the transport of information (telecommunication and the like). I shall return to these functions shortly, meanwhile let us try to take the right way. Actually, I think I have already done it, seeing that for those of young spirit I have added two brief mathematical presentations of linear fields and nonlinear fields.

Argument

The moment of truth is with me. I am here standing up to be counted. I asked and obtained help from a simple drawing that altogether represents the surface of a sphere with its linear field which is indeed the radiative field of James Clerk Maxwell and with its nonlinear field which runs along the expansion and/or gravitation orthogonal (perpendicular) to the radiative field.

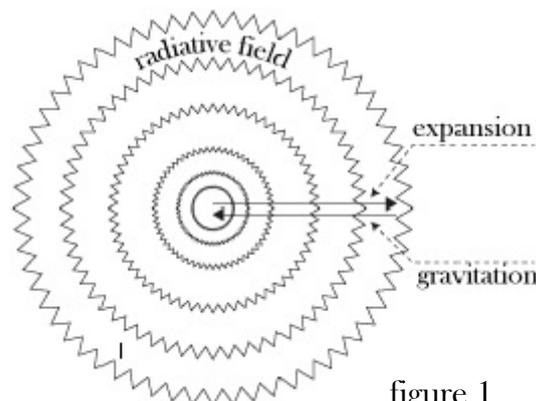


figure 1

What we are seeing in figure 1 it may be applicable to free (optical) space or, if need be, we can extend the physical concept to the entire universe. We can do this keeping in mind that free (optical) space is a substance in expansion made of infinitely many electromagnetic point-sources of self-generating energy each having its own unsaturated sink with continuous absorption because of the finite and uniform expansion. These pointlike point-sources must be considered inertial

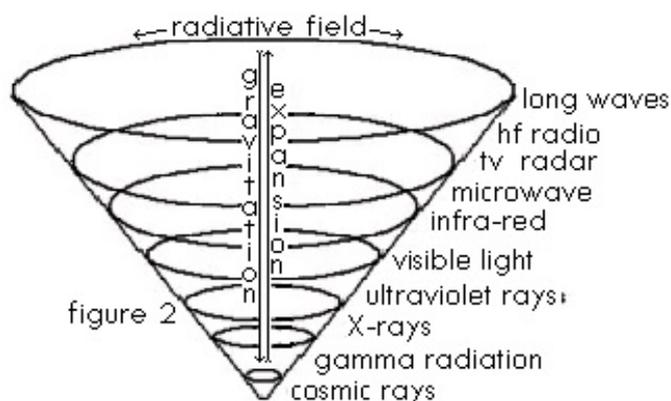
frames moving at the speed of electromagnetic radiations and consequently their slope is $1/c$, or 3.335×10^{-11} centimetres per second. Following this line of thought and thinking for a moment of the universe as a sphere, we have before our very eyes the two faces of the one and only identical reality; we have first a nonlinear electromagnetic field known as the gravitational field when we move from the outer edge of the sphere towards the centre; and then we have a linear electromagnetic field known as radiative field when we move transverse to gravitation and along any given wavelength, that is: forming a circle starting from any point along an imaginary radius to indicate the type of electromagnetic radiation we have chosen.

I shall herewith point out to the reader that my proposition finds strong support in the empirical evidence of:

1. Radiating energy in the gravitational field (nonlinear field) where the energy itself is variable even though the speed remains constant throughout the energy steps, and
2. Radiating energy in the electromagnetic field (linear field) where the energy is constant and the speed is constant.

This is then the universe in which we live and, by the look of things, it appears to have two different physical structures: one running transverse to the other. We may then say that in order to explain the large scale behaviour we experience, the universe must be seen in two distinct ways. In the non-linear, gravitational field, the wave propagates with direction in space becoming longer up to, and not exceeding, the finite length of 300 million metres. This explains why at each energy level the wavelength is not the same and the waveform is not the same; and this also explains why along the expansion/extension and/or gravitation there is no signal transfer, or telecommunication.

On the other hand, when viewed transverse to the expansion and/or gravitation (linear field), the wave is separated from the one that comes before and/or after by Planck's distance and because of this thick succession it may be considered to be resident energy and as such it maintains the same length and the same form, and it is part, together with similar waves, of a telecommunication channel for any electromagnetic disturbance or signal to travel with direction in space.



To show the difference between gravitation (nonlinear field) and the radiative field of Maxwell (linear field), I have sketched a sphere-like figure. In order to enrich our mental picture, I would now like to show this difference with a cone-like figure which represents the electromagnetic spectrum in its nonlinear conformation and it incorporates the full scale of electromagnetic radiations, while its linear aspect shows once again Maxwell's radiative field along which we note that the waves have the same frequency and the same wavelength and this qualifies all possible channels as frequency carriers for telecommunications and play host to any electromagnetic signal.

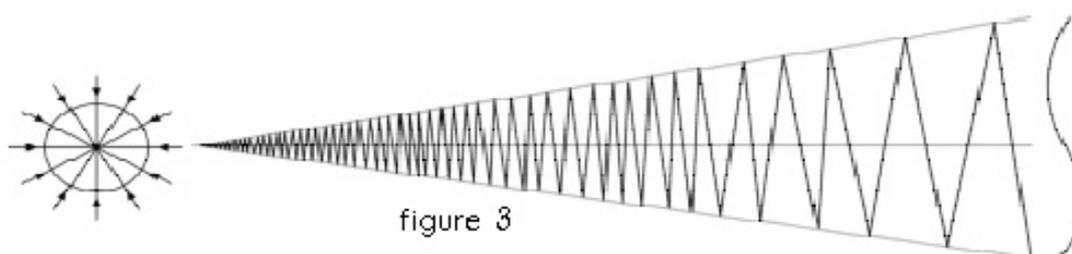
Further, if we put the cone upright as seen in figure 2 and identify it with the electromagnetic spectrum, we can easily imagine all radiations running orthogonal to it. From gamma radiation at the bottom, to visible light confined half way through, to long waves. All radiations have the same speed of the spectrum, they all have a frequency range which belongs to the spectrum, they all have an inner structure coming from a transverse section of the spectrum.

At this point in time I would like to specialize the two aspects marking electromagnetic radiations represented by the electromagnetic spectrum, that is to say: linear field and nonlinear field.

❶ The linear field running transverse to the expansion allows us to use any form of tele-vision, tele-communication, tele-observation and the like. Thanks to radioastronomy we are able to observe the celestial vault in all frequencies: infrared rays, X-rays, in the radio band and all the rest. One can do all this and much more because the radio signal, the vision, the observation, the angular resolution, or whatever use a channel with the same wavelength. A wavelength whose constant amplitude may be shaped by an electromagnetic disturbance of a given form as an input signal at the origin, which will then be transported and finally received in the same form as an incoming electromagnetic signal at destination. The wave must therefore possess constant amplitude and constant wavelength while its phase must be variable in time as requested by the spatial path. It is necessary to reiterate that in the linear field what is really travelling with direction in space is the signal or electromagnetic disturbance and not the so-called progressive wave.

❷ The nonlinear field is something else. Here we have a binding energy that does not exist in the linear field. Here, we see strength, we feel a push, we perceive a manifestation of power, we have the sensation of an energy progressively bound for the creation of each and every wavelength. In addition, in the nonlinear field is the wave expanding and/or extending with direction in space and it is for this reason that it is characterized by amplitude, wavelength, and phase all three variable in time. Better still, the wave expands itself up to and not exceeding 299 millions 792 thousands 458 cycles and/or metres. Usually rounded up to 300 millions or in scientific notation to 3×10^8 .

Retaining in the background the electromagnetic radiations represented by the electromagnetic spectrum, I shall now introduce the physical process of creation which is after all the negative energy pushing outwards, the first cause of what Science calls “the expansion of the universe”.



As we can see in figure 3, the process is subdivided in three parts. The first part is the magnetic monopole created by the magnetic point-source. The second part is the process itself which during its creative stage it comes to form a nonlinear field characterized by ascending wavelengths and descending energy levels. A field in expansion which is indeed the nonlinear conformation of electromagnetic radiations not yet completed. The third part shows instead an adynamic magnetic undulated line as a result of a single process of creation lasted just one second.

As for the central section represented by the electromagnetic spectrum proper, we must imagine it in a perennial phase of creation. The magnetic charge taken at the origin by the magnetic

monopole has the function of supplying the necessary energy for the lengthening of the wavelengths, of all wavelengths. From cosmic rays whose wavelengths are very small indeed up to cerebral waves whose wavelengths go from 7 million 500 thousand metres (the shortest) to 150 million metres given by the last cerebral delta wave. The process of creation comes to an end with an adynamic magnetic undulated line long 299 million 792 thousand 458 metres which is being added to the spatial extension of the universe. Further, since the process of creation is outdistanced from the one coming before and/or after by Planck's distance, we may consider the microworld as well as the macroworld perennially occupied by electromagnetic radiations. The microworld all taken with high energies descending levels (from cosmic rays to infrared rays and the beginning of microwaves) and the macroworld all taken with low energies descending levels (from microwaves to cerebral waves).

I shall now make some basic considerations to help me follow the pathway which from the monopole's starting springboard comes to an end with very long waves (delta brain waves falling within 0,5 and 4 cycles per second or Hertz). The conditions in being are:

- ① Empirical evidence shows that uniform motion in free (optical) space magnetizes all bodies mass-carrying and non.
- ② The physicist experimentalist Max Planck's linear distance, confirmed to have the value of 1.616×10^{-35} metres it implies the existence of pointlike limits.
- ③ The American astronomer Edwin Hubble in studying the Cepheids (variable stars), in 1929 did establish that the universe is expanding.

Making treasure of my own considerations, I have come to the inevitable conclusion that what is known as the gradation scale of electromagnetic radiations is the driving force that bears the weight of universal expansion. I recall now the magnetic monopole which is the prime mover of a chain of events repeating themselves from time immemorial.

- ① Free (optical) space is made of infinitely many pointlike limits due to the existence of Planck's distance.
- ② The pointlike limits are magnetized by the finite and uniform speed of the expansion of the universe and become magnetic monopoles.
- ③ The magnetic monopole (the prime mover) at the instant of its creation induces an electric field which in turn, and in obedience to Faraday's law, gives body to a chain of reciprocal electric and magnetic inductions.
- ④ The electromagnetic induction gives body to the entire range of electromagnetic radiations represented by the electromagnetic spectrum (the driving force). The entire range of radiations is created at each and every second of time and it must be thought of as being in a perennial stage of creation.
- ⑤ At each inductive exchange between electric and magnetic forces and fields, the energy taken at the point-source by the monopole halves itself and it is spent for the lengthening of the radiations' wavelengths whose gradation scale is in the process of being created.
- ⑥ On reaching the 1 millimetre wavelength (the blu end of microwaves), the process of creation leaves the microworld to surface in the fully expanded time dimension (our world) and here it leaves the indelible marks of its own passage covering as a snow mantle the whole of the surface of the universe.
- ⑦ The electromagnetic chain induction reaches its completeness with an adynamic magnetic undulated line 300 million metres long which is its own contribution to the expansion of the universe.

To enrich the mental picture that we all have come to form, I shall now elaborate a bit further and give a more extended meaning to some aspects in the above mentioned chain of events.

- I Since electromagnetic radiations fill up the whole of free (optical) space ④ that there is in the universe and their gradation scale (the electromagnetic spectrum) has the function of expanding in time and extending in space and thereafter contribute to the universal expansion, I must point out that the latter belongs to the nonlinear field, while radiations, when taken singularly, are orthogonal to the expansion and as such they belong to the linear field, see figure 3 above.
- II Event ⑤ spells out quite clearly that electromagnetic radiations are created today in the same way that they were created at the dawn of time. My statement finds support in the simple fact that electromagnetic radiations are mass-less filaments giving body to the inner structure of space, being it during its creation or fully expanded. They are billions of years antecedent to the atom, to the nucleus, and to the particle. They are antecedent to intergalactic dust and to whatever form of nebulae. They possess a finite and uniform speed and dictate the physical laws in the microworld and in the macroworld.
- III The presence of microwaves covering wholly the universe surface ⑥ is a tangible proof of the existence of a microworld network (the driving force) creating electromagnetic radiations, creating time and space, and creating the outwards push for the expansion of the universe.
- IV The adynamic magnetic ondulated line of ⑦ did not have the strength to induce a further electric field since, we may conjecture, the magnetic charge taken at the point-source from the monopole was spent during the physical process which has created with that charge a unit measure of time and/or space.
- V Electromagnetic radiations (wavelengths from 1 millimetre upwards) may be considered as being part of the fully expanded time dimension (our world) this frequency range includes microwaves (from 1 millimetre to 30 centimetres) and all radio waves (short, medium, and long).

To the aforesaid natural electromagnetic fields, were added, during the industrial revolution, some artificial ones born within the scientific and technological development. There are also electromagnetic fields at low and very low frequencies (100 - 60 - 50 Hertz) industrial and domestic electricity and finally brain waves (from 0,5 to 40 Hertz).

The physical process of creation, as already mentioned, comes to an end with an adynamic magnetic ondulated line long 3×10^8 metres which is being added to the spatial extension of the universe.

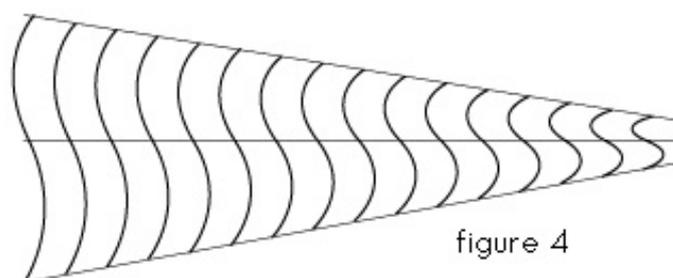


figure 4

Figure 4 represents a train of adynamic magnetic ondulated lines moving out with direction and orientation along a spatial axis obeying the inverse square law. Well, the microworld and the macroworld are the natural and exclusive habitat of electromagnetic radiations which give body to the physical process of creation which in turn it has the task: (i) to lengthen all wavelengths

from the beginning to the end of the gradation scale of electromagnetic radiations, and (ii) to push outward and contribute to the expansion of the universe. Electromagnetic radiations are very small radiative mass-less filaments whose growth is orchestrated by the physical process of creation which is a process in progress today as it was at the dawn of time.

Conclusion

The science I have been talking about and I am talking about, I observe it and I comb through it because it is under my feet and if there are approximations they are there to be seen. I do not look and I do not want to look too faraway at 14 or more billions of light-years to tell afterwards a fairy tale that the distance renders irrefutable. I prefer to burn my fingers with local radiations to sustain that I could have done it at billions of years from here. In other words, if the filaments of electromagnetic radiations are created at a finite and uniform speed, and this is beyond any doubt, if they are mass-less as in fact they are, and if they are antecedent to matter, then we are talking about free (optical) space. We are saying that electromagnetic radiations made of filaments are nothing else but space in its most pristine form imaginable. The same space within which Henry Cavendish with his constant of universal gravitation established over two hundred years ago, that two mass-less point-sources run away from each other at a composite speed of $6,67 \times 10^{-9}$ metres per second, each contributing a speed of $3,335 \times 10^{-9}$ metres per second and each contributing at a mutual repulsion, or to the space extension existing in-between them. The speed of $3,335 \times 10^{-9}$ corresponds to the slope of $1/c$ where “c” is the speed of light, or perhaps I should say the speed of electromagnetic radiations. I can also say and I will say: the same space that the guy of the big bang wanted to use even though he knew nothing about radiations and finite and uniform speed; and since he was also in a hurry, he thought to apply an accelerated redshift outrageously unique in its genre (from cosmic rays to microwaves) and take only 40 seconds to put together something that for the electromagnetic radiations standard it had to have a radius of 15 billions light-years and a matter density ready to be eligible for the formation of billions and billions of galaxies each of which populated by a billion stars. The whole thing in no longer than 40 seconds of the clock. Good on him to be fortunate enough to have found a cheering audience.

I am closing this work of mine titled: Linear field and Nonlinear field with an elementary recall to memory. George Gamow was one of the few scientists back in 1948 to give a significance to the electromagnetic radiations leaving the microworld to surface in the macroworld in the blue end of the microwaves band of frequencies. At the time it was fashionable what from 1949 onwards was called big bang. For Gamow it was naturally enough to associate microwaves to the big bang also because already in 1940 he proclaimed himself a strong supporter of a beginning of the universe that from an infinite density manifested and expanded itself with an explosion/implosion or call it what you will. These were obviously small compromises that Gamow had to do. As compromises were: (i) the so-called singularity, (ii) a density which had to consist of the equivalent of billions and billions of galaxies, (iii) the big bang itself, (iv) the microwave radiation with a redshift covering almost all the electromagnetic spectrum, and (v) all the rest. Not to speak of the compromises that Science had to do in the last fifty years and of which Gamow would have felt the mental load.

Well, George Gamow preferred to explain the presence of microwaves on all the universal surface as the afterglow left by the big bang. I preferred and prefer, as stated in other forums, to explain the presence of microwaves on all the universal surface as a tangible proof that electro-

magnetic radiations are here today to perform a precise task, and were there in the midst of time with the same task. They are leaving the indelible marks of their passage here, and left the same indelible marks of their passage there. They are nowadays surfacing in our fully expanded world with 1 millimetre wavelength here, and have surfaced in the fully expanded world billions and billions of years before the 14 billions of years ago (big bang) with 1 millimetre wavelength there. This last assertion of mine is sustained by the simple and scientifically articulated realization that electromagnetic radiations with all their complexity could not have been created in forty seconds of the clock by the big bang or any other witchcraft. This is the reality that we can see with our very eyes. This is what we all call Science, and outside of it one can only tell fairy tales.

Before closing, I shall recall to memory that if the universe is expanding as it appears to be, then only electromagnetic radiations in their nonlinear conformation can supply the necessary energy. Only electromagnetic radiations occupying the whole of free (optical) universal space can expand this balloon whose circumference seen along billions and billions of light-years it is shown to be almost a straight line. It does not exist and nature does not offer any other type of energy so equally distributed that meets the requirements. These are: ① starting point the bowels of the universe (Planck's distance) to circumscribe the whole, ② energy pushing outwards (negative) available locally on the entire universal surface to guarantee a uniform and constant expansion, ③ magnetic charge to trigger the electromagnetic induction, ④ high energies for the lengthening of wavelengths along the physical process of creation, ⑤ low energies to surface in the fully expanded time dimension (our world) without causing any damage, ⑥ adynamic magnetic undulated line, (i) to contribute to the expansion of the universe, and (ii) to complete the physical process in the macroworld.

I shall now close with a pleasing thought. I have had the privilege and the honour of knowing in two occasions and for a few minutes lady Rita Levi Montalcini. At our first encounter she confided to me of having been eye witness of the first chicken and egg paradox. First in the sense that the gentle lady was speaking of molecular level, she was referring to proteins and nucleic acids. I did not say, not even at our second meeting, that I had myself made the same experience. For me it hasnt been a first case of molecular, atomic, or nuclear level. I found myself amongst electromagnetic radiations, right in the middle of absolute space, in front of the most pristine form of free (optical) space. Here is my experience: the expanding universe with its finite speed generates a magnetic monopole and the monopole with its magnetic charge initializes the process of creation and it generates the outwards push that contributes to the expansion of the universe. Well, here is the paradox: the universe creates the monopole and the monopole creates the universe. I have applied Occam's razor and the answer was satisfactory. Also lady Levi Montalcini with her gentle ways and her inquiring mind got rid of her paradox.

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thankful am I and with no grudge
if you read my work in a single breath
stand up then and be my judge
speak your mind and give me no death

Let us now go play with some numbers!..... just a few!

at destination. To put it differently, the electromagnetic wave is ever present at any given point in space and ready to be used by a transverse electromagnetic signal of any given frequency at that point.



In figure 1 I show that unless the waves have the same amplitude all along the level of flowing energy; the output signal at destination, because of the spatial separation of the point-sources generating the vibrations, it cannot be an exact replica of the input signal at the origin. As a consequence there would be no signal transfer since the imprinted waves at the origin would not persist in the same form and would actually die out. It is quite clear, then, that each level of flowing energy consists of energy steps proper of the expansion and/or extension; these steps, moreover, when seen transverse to the said expansion and/or extension are characterized by a permanent energy whose strength is dependent upon the position of the energy step along the electromagnetic spectrum. The closer the energy step is towards the point-source the greater the strength. To complement the above, I may say that while the power (wattage) emitted by a radio transmitter is sufficient enough to imprint a train of waves, its contribution towards the transmission of a given radio signal is almost zero and it would have a negligible influence in long distance transmission of signals. A higher output wattage on the antenna produces only a stronger signature on the train of waves or wave packet to make it more suitable for longer distances, but it does not add energy for the transmission of the signal. In brief, the message that I am trying to get across is that whenever we use our mobile phone to call someone, the energy needed to establish the radio contact is already embedded in the space region between ourselves and the recipient; the energy output of the mobile phone (wattage on the antenna) is needed to give a form to a train of waves which are already there. To specialize my sentence, the power flux known as the Poynting vector exists in nature; the artificially generated energy is injected into the electromagnetic «network» to join with the power flux and the two together will then become an electromagnetic signal.

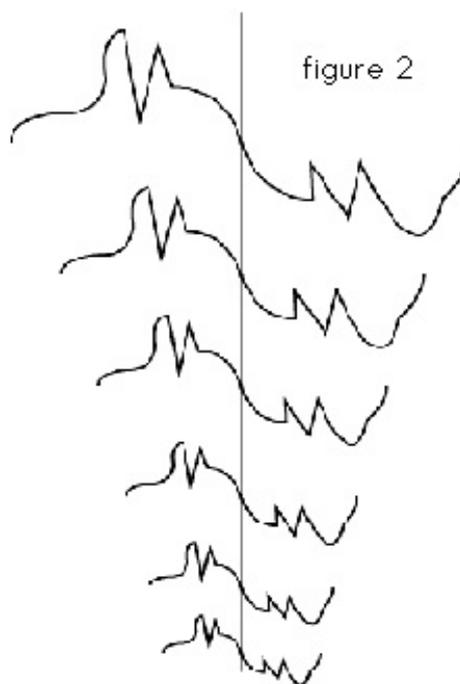
I have set forth these considerations in order to make a distinction in kind between the level of flowing energy which is a frequency carrier propagating in space to infinity (our proposition ①) where the amplitude must be periodic and uniform, and the level of expanding and/or extending energy which is a time and/or space process expanding in time and extending in space locally to a finite length of 1 second of time and to a finite distance of 300 million metres of space (our ongoing proposition ②) where the amplitude must increase at each level along the expansion in time and/or extension in space. Either way, the wave, in the process of extinguishing itself while creating time and/or space, must increase its amplitude and must, then, increase its wavelength. Well then, if we were to translate the above statement into a mathematical construct, it is clear that equation (1) will not do. We must instead find a mathematical solution for all possible values of the electromagnetic wave as a time-processor and/or space-processor. Hence, I introduce here another newcomer:

$$\Psi(x,y,z,t) = \Psi_0(x,y)e^{i(\omega t - k_E z)} \quad ..2$$

where the amplitude Ψ_0 is no longer a constant. We now have, in fact, a wave whose energy flow

is in the direction of the z-axis of space while the (x,y) axes have become variables (spatial extension) and the (x,y) plane itself has now become a function of time (temporal expansion).

The parameter k_E is the time expansion constant. Figure 3 is the geometrical expression of equation (2) and it shows a progressive wave whose wavelength expands itself in time and extends itself in space. The length of the space extension, or wavelength of the time function, as it is clearly shown, can be represented by a series of extensions of the same graph amplified uniformly and progressively. It is to be noted that while the wavelength gets asymptotically long (longer and longer) during the expansion and/or extension, the energy needed for the lengthening of the wavelength is supplied by the electromagnetic point source at the origin which in turn is caused by the ever expanding universe. To be also noted that the



waves are moving in the nonlinear field hence do not retain their wavelength and their waveform. I have sketched an overview of what throughout my work I have called energy expanding and/or extending levels (the field of the graviton) and energy flowing levels (the field of the photon). It is well known that since the very beginning of the modern scientific era, the speed of light has been and still is applied indiscriminately to both gravitational (nonlinear) field and Maxwell (linear) field. I have made a distinction in kind between the two aforesaid fields, I shall now make a similar distinction between the speed of light as it is intended by the scientific formalism and the speed of light as introduced in this work.

To begin with, the speed at which time and space are processed must be viewed in two different ways: linear and nonlinear. Let us see first what happens in Maxwell's world. In the linear field, all electromagnetic radiations are characterized by the linearity of the field which possesses no binding energy and which runs transverse to the expansion and/or gravitation. This is clearly shown in the description of the photon; v iz:

$$\begin{aligned} \text{momentum } p &= E/c \\ \text{wavelength } \lambda &= h/p = hc/E \end{aligned}$$

and in general in all equations related to telecommunications and in those describing linear optics; such as this one:

$$t = nx/c \quad \dots 3a$$

where "t" is the transit time of a light ray through a given substance "x", and "n" is the refraction index of that substance. In the nonlinear field, we do not see anything of the kind; that is to say, it does not exist the so-called ray of light, what we have instead is the process of physical creation. Further, in this field, that is: in the nonlinear field (expansion and/or gravitation), the adoption

of the speed of light “c” with its implied meaning of distance runner is not conveying what is actually happening in the physical action described by a nonlinear equation and it is, one might say, altogether theoretically misleading and otiose. This speed seen often in expressions such as:

$$\begin{aligned} \text{the Schwarzschild radius: } r_o &= 2GM/c^2 \\ \text{the line element: } ds &= (c^2 dt^2)^{1/2} \end{aligned}$$

and many other equations of the same kind does not have the same meaning of the speed “c” of Maxwell. For example, although our physical laws use the same symbol “c” and give the same physical significance to the radial speed of time and to the linear speed of light, the relation:

$$\Delta E_b = \Delta mc^2 \quad \dots 3b$$

clearly shows that the speed of light squared (c^2) is nothing else but the binding energy of the change of energy (ΔE_b) and the change of mass (Δm) of any atom (Δ =delta).

I have put in relief the difference that exists between the radial speed in the nucleus of an atom of (3b) and the linear velocity of light of (3a) to show that their physical function does not explain the fact that they are, and have always been, mathematically treated on the same footing. For example, the physical significance of the linear velocity of light which we see in equation (3a) and that of the radial speed we see in equation (3b) is totally different.

As for the physical significance of that symbol “c”, I shall here point out that a ray of light could be stopped, warped, or even deflected by an ordinary household mirror. As we all know, a common sheet of lead can stop, in the linear field, X-rays which are much more energetic than a ray of light. To bend a ray of light we do not need a black hole to put up a show. A black hole does not stop or bend an ordinary light ray and pulls it in candle-like as it is generally shown by the relevant scientific literature. The show that a black hole would offer it would be that of shortening to the point of invalidating locally the electromagnetic process of temporal expansion and/or spatial extension. In other words, a black hole is a gravitating body whose mighty force of gravity manifests itself in the nonlinear field where a ray of light is altogether alien. Better still, the powerful attractiveness pulling backwards of a black hole manifests itself in our telescopes with its variety of colours and/or its external aspect things that Science calls neutron stars and quasars of various sizes and measures. When the force of gravity of a black hole reaches its maximum intensity there will no longer be colours, there will no longer be an external aspect given by radiative filaments which used to create wavelengths for time and space. It will remain in that given point a colourless hole in the time and/or space fabric. In the given space extension occupied by the black hole, the parameters time and space are no longer created, they are no longer renewed.

After the necessary digression, I shall conclude this work of mine by reminding the reader that with reference to the indiscriminate application of the speed of light, my considerations are here within the limits of principles strictly scientific. In brief, I did not try to force a square block into a round hole; on the contrary, I was simply specializing something that belongs, and necessarily belongs, to two different projections of the same thing.

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