

The theory of string: a candidate for a generalized unification model
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Abstract. The book "From Physics to Metaphysics" proposed a simple model of the birth and of the evolution of the universe. This paper compares this model with the theory of the strings, and translate it in terms of the latter. Since the model explains also the realm of Life and of Thought, the above comparison would candidate the theory of strings for a generalized unification theory: that is a model which includes also the realms of Life and of Thought. The action of quantum oscillations on the coherent dominium of the cerebral water and thence on the evolution of each man and of mankind have been evidenced.

The mathematic version and of the parallelism between this model and the theory of strings and the connections between the model and some equations concerning D-term strings are respectively reported in Appendix 1 and 2

Riassunto. La comparazione del modello esposto nel libro "Dalla Fisica alla Metafisica" sull'origine e l'evoluzione dell'universo con la teoria delle stringhe ha consentito di candidare quest'ultima a teoria generalizzata del tutto, proprio perché il predetto modello é esteso anche ai reami del vivente e del pensante. E' stato mostrato, infine, un possibile effetto dell'azione di oscillazioni quantistiche di stringhe sul dominio di coerenza dell'acqua cerebrale e quindi sulla crescita dell'entropia negativa nell'attività del cervello con i suoi benefici effetti sullo sviluppo dell'uomo e della civiltà.

La versione matematica del parallelismo fra il modello proposto e la teoria delle stringhe e la rappresentazione del modello secondo stesso secondo le equazioni dei termini D della teoria delle stringhe sono esposti rispettivamente nelle Appendici 1 e 2 del testo..

Parallelism between the Palumbo's model → and the theory of strings

a) The Palumbo's model hypothesizes that the universe was originated by a very large spectrum of waves **F** and evolves through the action of waves F_i belonging to **F** (Palumbo, 2001). Summarizing, the model follows the evolution of the universe:

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0.01 sec. after the big bang radiative forces transformed themselves in electrons, protons and neutrons; 900 millions later appeared the electromagnetic waves of the light, 3.8 billions of years ago, an electromagnetic wave excited the organic matter down the ocean generating the life. In this realm a radiation combine two molecules of Hydrogen and one of Oxygen generating water; some radiations belonging to the spectrum of visible caused the most important natural phenomenon: the photosynthesis and thence the appearance of Oxygen. These gases will filter the extreme u.v. radiations allowing the growth of the realm of animals. 2.400 millions years ago, a radiation caused the mutation of the gene MHY16 of a hominide generating the man. From what above the birth and the evolution of the universe would had been determined and governed by radiating forces → Theory of strings states just the same.

b) In extreme conditions, black holes become elementary particles and viceversa (Palumbo 2005) → Strominger (1995) Strominger et al (1996) have shown that such a change, in theory of strings, can be explained as a phase transition.

c) The F_i waves that generated the fermions would correspond to → the modes of a supersymmetric string that made up the heavy particles appeared with the Big Bang, which sudden decayed into light particles.

d) The F_i transmit musical messages → the electric charges of the particles.

e) The activity of the brain may be excited by resonant interactions among external waves F_i and internal electromagnetic waves → interaction among weak external string modes with internal particles showing the same dimension-language.

f) The identification of the body asserted by the interaction between the nervous and the immunitary systems → through the common dimension-language hidden into the body.

g) $\mathbf{F} = F = \int_0^{\infty} F_i dF_i$ where \mathbf{F} denotes the universal original waves that originated the Big

Bang and all

h) the partial F_i waves, belonging to \mathbf{F} , which originated, successively, the inert matter and the realms of Life and of Thought → \mathbf{F} is the mode of a bosonic string having mass equal to zero; F_i are the oscillation modes of supersymmetric strings. Since the universe is expanding (and accelerating) it seems reasonable that \mathbf{F} would correspond to an anti-graviton with energy equal to that of a string with 10^{80} Planck energy unit, (corresponding to the Big Bang one) so that the above relationship may be written:

$$F = \int_0^{\infty} F_i dF_i \rightarrow - \text{bosonic string mode} = \text{all supersymmetric string modes (see Appendix 1)}$$

where the sign minus indicates the expansion force: i.e. the Einstein cosmological constant. It follows that \mathbf{F} may be represented in a 26 dimension space, whereas F_i require only a 10 dimension space (the 6 ones described by Calabi-Yau plus the ordinary four ones).

Since the biological beings are open systems, they have been investigated like the other general dynamic open sets (Appendix 2).

Appendix 1 describes, in mathematical terms: (i) the bosonic string action, (ii) the superstring action, (iii) the graviton as due to a particular mode of oscillation of a bosonic string (SCHERK et al.1974), (iv) the dark energy and dark matter coming from the above correlation,

represented by some equations showing the time-dependent configurations concerning accelerating universes.

Further correlations between Palumbo's model and theory of strings are reported in Appendix 2, where there are also reported, in mathematical terms, the correlations discovered here, between the equations of open sets (Stampacchia 1958) and some solutions of the equations of the theory of strings, which describe the naked singularities.²

- i) The major discoveries of the 20th Century came from the nuclear physics: i.e. from the studies of the smallest particles and the greatest energies. The worth of the energy of Φ is related to the smallness of the masses and of the wave lengths → string theory deals with particles having Planck dimensions and energies, so that the Life energy and the Thought energy could be explained by this theory.

Effect of quantum oscillation of weak strings on biology

The frequencies typical of the cells and tissues range from 1 to 100 Hz (cyclotronic frequencies) corresponding to a range of energy from 10^{-15} to 10^{-13} eV much lower than the lowest values corresponding to the electromagnetic waves. It follows that the latter would not affect directly biological structures.

There are strings with energy, ranging from the one related to the explosion of the Big Bang (10^{80} unit Planck), to those with extremely low energy down to 10^{-6} GeV, that are originated by means of cancellation processes (Witten 1995, 1995a)

The energy of one unit Planck string is 10^{19} GeV = 10^9 Joule. The energy of the quantum oscillation associated to this unit string is equal to $10^{2.6}$ GeV, i.e. about 10^{17} times lower.

It follows that the quantum oscillation associated to a weak string with energy equal to 10^{-6} GeV is 10^{-23} GeV = 10^{-14} eV = 10^{-33} Joule. From $E = h \nu$, $\nu = 10^{-33} / 6.6 \times 10^{-34}$ equal to about one Hz.

The frequency of the quantum oscillations associated to the above weak string are thus coherent with the frequencies typical of cells and human tissues and may interact with them.

Effects of quantum oscillation of intense strings on the coherent dominium of water

Preparata (1995) has identified, in the water, two different dominions: an unstable one governed by the turbulence induced by the temperature, which obviously contributes to the positive entropy, and a stable one characterized by in phase quantum oscillations, which do not provide positive, but only negative entropy. The energy of these oscillation is equal to 12 eV, corresponding to a frequency of 10^{15} Hz (Del Giudice et al. 1993).

This theory has been recently contested since it would have been based on the wrong assumption that the probability for the molecules H_2O to be in an excited state was higher than the probability for them to be in a normal state.

² It is worth recall that the black hole is a singularity bounded by event's horizon whereas the original black hole, i.e. the big bang was an unbounded singularity, and thence a naked singularity. This would suggest an analogy between the Angels and the Mankind: the former representing closed singularities and the latter naked singularities..

The Preparata's hypothesis would still hold if there would be a source of energy capable to excite (to pump), by a resonant effect, the dipolar swinging oscillations of the H₂O molecules, vibrating with a frequency equal to 10¹⁵ Hz.

The extreme energy of cosmic rays exceed 10²⁰ eV, corresponding to a frequency equal to 10³⁵ Hz. To each oscillation there is a corresponding quantum oscillation, whose energy is 10¹⁷ times lower, so that a quantum oscillation associated to a cosmic ray with energy equal to 10¹⁷ eV and a frequency equal to 10³² Hz, would have a frequency equal to 10¹⁵ Hz, capable to induce resonant effect in the coherent dominium of water. This is consistent with the effect of cosmic rays on the evolution of each man and of civilization (Palumbo 2006).

Consequences of quantum oscillation of intense strings on man and civilization

The human body, and notably the brain, is composed in prevalence by water. It is thus probable that the quantum oscillations of the coherent dominium of the cerebral water and thence the level of negative entropy may be amplified by resonant effects induced by the quantum oscillations of strings.

On the other hand, mankind is characterized by the "inborn" dominium and by the "knowledge" dominium, respectively with poor and high negative entropy. The earlier, common to the animals, is hardly directly controlled, whereas the latter is governed by the man. The interaction with the external excitations and notably the education, reduce the first dominium, increasing consequently the other and thus the negative entropy of a man.

In terms of the level of negative entropy, the coherent dominions of the cerebral water and the dominium of "knowledge" are analogous.

The effects of the education and of the string's excitations, make the difference between a man, whose efforts increase the dominium of knowledge and another one who does not. The education notably makes the dramatic difference between a man, characterized by a large dominium of the knowledge that influences his history and his activities, and an animal whose small, "rigid" and closed dimension of the knowledge dominium does not allow any evolution.

Another difference may be observed in the relative weight of the brain (the ratio between the weight of the brain and of the body) much major in man, whose evolution has been due to the growth of the brain and to its adaptability. It is worth noting that the brain of an insect is like the point of a needle, and thence rigid and perfect and has therefore had, nor will have, any evolution in its history. To the contrary, the "imperfect" adaptable brain of a man has allowed his evolution.

Larger volume of the human brain implies grater amount of water and thence larger dominium of coherent oscillations and major negative entropy. The combined effects of education and of quantum oscillations of strings, enlarging the dominium of coherence, induce an increase of negative entropy (or the reduction of the positive entropy) and thence of the cerebral activity and of the evolution.

The boundary separating the above two dominions represents a critical state, since the oscillating particles pass from one dominium to the other. The highest criticality is achieved

during the strongest intensity of the conflicts between the two dominions, when a man experiments the highest level of tension that may induce discoveries, arts, ecstasy, and even madness. Often, a man experiments radical transformations after a crisis and social systems experiment the major evolution during the wars. Similarly, the greatest catastrophes have marked the evolution of the universe that changed from the original dark chaos, characterised by the max positive entropy to the beauty of life: the major values of the negative entropy.

The atheistic Einstein believed the order and the harmony of the universe and thought it was a deterministic macro system. To a fellow, who asked him what was the use of his formula $E = mc^2$, he simply answered: it is beautiful in itself, meaning that beauty is expressed by order and harmony. The beauty of fractals (Peitgen and Richter 1986) described by the criticality of natural systems would signify just the contrary: negative entropy and beauty are features not intrinsically belonging to the universe, but are achieved through its chaotic and critical evolution.

The evolution of the dynamical system (Devaney 1990) "man" is much influenced by the contrast between (i) the incoherent and the coherent dominions of the cerebral water, or (ii) the inborn and the knowledge dominions.

The orbits of the points representing the evolution may tend to the stable or to the critical states. The boundary separating the points that originate orbits that tend to these two different states may be reported and coloured on a computer sheet and provide pictures showing the beauty of fractals (Peitgen and Richter 1986).

In conclusion, intense criticality implies => enlargement of the coherent dominium => major negative entropy = higher cerebral activity and even => beauty.

Conclusions

The Palumbo's model (5.1) is equivalent to equation (5.7) implying that the universe was originated from the action of a bosonic string (the left hand of eq. (5.7) and is evolving by means of the action of supersymmetric fermionic strings (the right hand of (5.7)). The sign minus indicates the expansion of the universe. The action of the quantum oscillation, associated to strong strings, enlarging the coherent dominium of the water inside the brain, increases the cerebral activity of each man, influencing thus also the evolution of civilization.