

A-Temporal Physical Space and Thermodynamics of Life

*Davide Fiscaletti, Amrit Sorli, SpaceLife Institute,
Via Roncaglia, 35 – 61047, San Lorenzo in Campo (PU), Italy*
FiscalettiDavide@libero.it
sorli.bistra@gmail.com

Abstract

A-Temporal physical space is a concrete space in which stellar objects and elementary particles move. Time exists only as a material change (movement) in a-temporal physical space. Change does not run in time, change itself is time. Time means change (movement). When there is no change, there is no time. A-temporal physical space has no entropy, no change, no time. It is the non-entropy state of energy. The density of a-temporal physical space depends on the amount of matter in a given volume of it. Gravitational force is carried directly by the density of a-temporal cosmic space. In a living organism the density of the energy of a-temporal cosmic space is higher than in the same dead organism. This additional density makes the entropy of the living organism lower with respect to the geological environment. A living organism is an open thermodynamic system and has an active exchange of energy with a-temporal physical space. Non-entropy state of the energy of a-temporal physical space is a driving force of the evolution.

Introduction

Cosmic space is a-temporal, time is a flow of irreversible material changes in a-temporal space. Change does not run in time, change itself is time. Clocks run in a-temporal space, with clocks we measure the duration and the numerical order of all changes. We are born, we live and we die in the same identical a-temporal space (1).

In the universe phenomena can be divided into two basic groups: temporal phenomena and a-temporal phenomena. For temporal phenomena to exist a movement of elementary particles (time) in a-temporal space is needed: for example light is a temporal phenomenon because for its existence the movement of photon through the space is needed. Human body including his/her mind is a temporal phenomenon, the result of the movement of billions of particles that build up the human organism.

For a-temporal phenomena to exist no movement of particles (time) in a-temporal space is needed. Gravitation is an a-temporal phenomenon carried directly by the density of a-temporal space (2). Consciousness is an a-temporal phenomenon as well. Penrose considers consciousness as a result of the force of quantum gravity acting on the neurons of the brain.

Additional Density of A-temporal Physical Space Into Living Organism And Additional Emission of Bio-photons At The Time of Death

Experiment with earthworms shows that the weight of living worms is bigger than

the weight of the same dead worms (3). Experiment is carried in a mass close system. Its most plausible interpretation is that a living organism has some exchange of energy with the a-temporal cosmic space (further only “ATPS”). In a living organism the density of ATPS is higher than in the same dead organism. This additional density plays an active role into functioning of living organism and in development of life in generally. Here life is interpreted as a continuous negentropic process in which matter develops towards the non-entropy state of the ATPS.

At the time of death it is not only that the mass of the organism is diminishing, the organism emission of the bio-photons increases for the rate from 10 to 1000 regarding the emission in a “normal state” when organism functions properly (4).

Definitely there is an “energy relation” between the decreasing of the mass at the time of death and the increasing of the rate of the bio-photon emission. About this relation further research will give you more information.

Thermodynamics Of Life

The mass difference at the time of death (**dm**) as well as the increasing of the bio-photon emission at the time of death show that from thermodynamic view a living organism is an open system with an active exchange of the energy. The mass difference can be introduced into Einstein formula ($E = m \cdot c^2$) as following:

$$dE = dm \cdot c^2 \quad [1]$$

where

- dE is the difference of the energy between a living organism and the same dead organism
- dm is the difference of the mass between that living organism and the same dead organism:

$$m_{\text{living}} - m_{\text{dead}} = dm \quad [2]$$

(and is a positive quantity)

- c is the speed of light

In other words, one can say that a living system has got a bigger free internal energy than the same dead system, according to the formula:

$$m_{\text{living}}c^2 = (m_{\text{dead}} + dm)c^2 \quad [3].$$

The difference in the mass, and thus in the internal energy, between a living system and the same dead system can be interpreted as an “additional density” of cosmic space in a living organism (living matter). Additional density of cosmic space around living organism causes the increasing of the gravitational force on it. By non-living matter density of cosmic space is in correspondence to the amount of matter in a given volume of cosmic space (3).

It seems that cosmic space plays an active role into evolution of life. Between living organism and cosmic space there is an active exchange of energy. Cosmic space has no

entropy, evolution of life can be seen as a continuous negentropic process which develops towards the non-entropy state of cosmic space.

The non-entropy nature of ATPS definitely is related to the phenomenon of consciousness, to the phenomenon of so called “life energy”, called also in Chinese traditional medicine “Qi” or “Prana” in Ayurveda, Indian traditional medicine, called by Wilhelm Reich “Orgon”.

Further research will give you more information of the way additional density of ATPS functions in a living organism and how much its functioning corresponds to the “Qi”.

A-Temporal Gravitation and its role in the evolution of living systems

The starting-point of a-temporal gravitation is that, on the basis of elementary perception, time exists only as a stream of irreversible material changes happening in cosmic space and that, therefore, the stage of the universe is not space-time (which belongs only to the mathematical models of reality) but is really an a-temporal physical space (ATPS). According to a-temporal gravitation theory, gravitational interaction is carried directly by the density of cosmic space and is a-temporal (in the sense that no particle or wave is needed for its acting). The density of space in a given volume of space depends on the amount of matter into it, precisely is given by the formula

$$D = m \cdot G / r^2 \quad [4]$$

where m is the total mass contained in the volume G is the gravitational constant, r is the distance between the point under consideration and the centre of the mass. Now, if according to experimental results the mass of a living system is bigger than the mass of the same dead system, it derives that also the density of cosmic space is bigger in the region occupied by a living system than in a region occupied by the same dead system. The additional density of physical space in the region occupied by a living system (with respect to the same region occupied by the same dead system) is given by the relation:

$$dD = D_{\text{living}} - D_{\text{dead}} = (m_{\text{living}} - m_{\text{dead}}) \cdot G / r^2 \quad [5].$$

One can say that it is as a consequence of this additional density that a living system has a bigger mass and a bigger internal energy than the correspondent dead system.

Besides, according to a-temporal gravitation, universe can be considered an a-temporal phenomenon with no beginning and no end: universe is a system in dynamic equilibrium that recreates itself. The active galactic nuclei (AGN-s) are the renewing points of the universe, have the role to keep the universe young. In AGN-s energy of matter transforms into energy of physical space and energy of physical space transforms back into fresh gas. This view is supported by some important recent astronomical observations (which suggest that Milky Way galaxy is eating the galaxy of Sagittarius and at the same time emits fresh gas).

As a consequence, the increase of the entropy of matter after fresh gas is thrown out from AGN-s is only temporary; it is renewed through the cyclic transformation “matter-space-matter-space...” happening in AGN-s. AGN-s have the role to renew old matter with high entropy with new matter with low entropy. The total entropy of the universe tends to zero with the increase of material changes happening in ATPS (3).

This means that the sum of the entropy of matter, of the entropy of space and of the entropy of living organisms is equal to zero:

$$S_{matter} + S_{space} + S_{living} = 0 \text{ [6].}$$

Taking the differential of this relation, we obtain that the sum of the variations of the entropy of space and of the entropy of living systems is equal and opposite to the variation of the entropy of matter:

$$dS_{space} + dS_{living} = -dS_{matter} \text{ [7].}$$

Therefore, taking into account that space is the non-entropy state of energy (i.e. its total entropy is constant and equal to zero: $S_{space} = 0$) and that the entropy of inert matter tends to grow on the basis of the second law of thermodynamics (namely $dS_{matter} > 0$), it derives the following result:

$$dS_{living} = -dS_{matter} < 0 \text{ [8]:}$$

the entropy of living systems tends to decrease with the stream of material changes happening in a-temporal physical space.

The decrease of entropy of living systems is tied to gravity, to the fact that in living systems the density of cosmic space is bigger than in the same dead systems. If the entropy of living organisms tends to decrease and physical space has no entropy, evolution of life can be seen as a continuous negentropic process which develops towards the non-entropy state of space.

The evolution of living systems can be expressed and studied also in the following manner. At the deepest level, one can assume that all reality we observe is composed by elementary packets of energy, called quanta of space (QS), having the size of Planck length and endowed with different vibrations (and, as a consequence, of different “states” of energy). QS constituting ATPS vibrate with the “basic frequency” and are the non-entropy state of energy; instead, matter is composed by QS vibrating at the frequencies characteristic of subatomic particles and are the entropy-state of energy (5).

Now, as regards living organisms, according to our research, they are composed by QS which tend to develop and evolve towards the non-entropy state of ATPS (with the increase of the stream of material changes happening in cosmic space). This means that the mean frequency of vibration of the QS composing a living system is bigger (and thus closer to the basic frequency of ATPS) than the mean frequency of the same QS composing the same dead organism.

In fact, if we indicate with N the total number of the QS composing a given living system (or the space occupied by the same dead system), we can write the following two relations as regards the frequency and the internal energy in a living system and in the same dead system. As far as the living system is concerned we will have

$$m_{living}c^2 = Nh\nu_{living} \text{ [9],}$$

where h is Planck constant, and thus the mean frequency of vibration of the QS composing the living system will be:

$$\nu_{living} = \frac{m_{living}c^2}{Nh} \quad [10].$$

As far as the same dead organism, we will have:

$$m_{dead}c^2 = Nh\nu_{dead} \quad [11]$$

and thus the QS composing it will vibrate at the mean frequency $\nu_{dead} = \frac{m_{dead}c^2}{Nh}$ [12].

It derives therefore the following relation between ν_{living} and ν_{dead} :

$$\nu_{living} - \nu_{dead} = \frac{(m_{living} - m_{dead})c^2}{Nh} \quad [13],$$

i.e. taking into account equation [2]:

$$\nu_{living} - \nu_{dead} = \frac{dmc^2}{Nh} \quad [14]$$

where dm is a positive quantity. Equation [14] shows just that the mean frequency of vibration of the QS composing a living system is bigger (and thus closer to the basic frequency of ATPS) than the mean frequency of the same QS composing the same dead organism. This result implies that the evolution of living organisms goes just towards an increase of the mean frequency of the QS composing them. The results of our research seem to imply that, in a certain sense, for the human being there is no choice: his evolution is determined by ATPS and, in particular, goes towards the basic frequency of ATPS.

Entropy and Evolution of Life in an A-Temporal View of the Universe

As far as the nature of evolution is concerned, there are two main trends: the thermodynamic evolution concerning matter, which goes downwards, i.e. towards higher entropy, and the evolution of life and consciousness, which goes upwards, i.e. towards smaller entropy and higher organization (6). Now, we want to point out that, on the basis of a-temporal gravitation theory, these two main trends of the evolution can be considered parts of a one universal process. Starting from this particular cosmological view, we will see that it is possible to introduce a new formula for the entropy of the generic region of the universe (which goes to substitute the Boltzmann formula of classical physics); this new formula will allow us to explain and reproduce both the increase of entropy concerning matter and the decrease of entropy concerning the evolution of living organisms.

In the self-renewing universe expected by a-temporal gravitation theory, evolution of life can be considered as a consistent part of cosmic evolution, as a continuation of the evolution of the universe. From this point of view, evolution on the planet Earth is a part of a wider universal process. All over the universe, life is developing towards the conscious species. In all the areas that have similar physical circumstances to the Earth, the development of life and its consequent evolution towards the conscious species can happen. Evolution of life can be interpreted as a process that is continuously developing

towards a total entropy that tends to zero (7).

In the whole observable space there have been discovered the basic organic molecules necessary for the development of life (8). Besides, astronomical observations show that the whole observable space is permanently in a phase of chemical evolution. This means that biological evolution and chemical evolution are in a certain sense parallel processes. In other words, one can say that chemical evolution is the beginning of the negentropic process of biological evolution: the formation of cellules, pluricellular beings and living organisms happens together with the process of the chemical evolution.

Because of the cyclic transformation “space-matter-space...” which occurs in AGN-s, each arbitrary region of the universe has got an entropy that tends to zero with the increase of the stream of material changes happening in ATPS. In particular, according to the research of our group, self-renewing universe with a total entropy that tends to zero suggests that a possible relationship between the entropy S of a generic region composing physical universe and the stream of material changes μ_4 happening in ATPS is given by the following formula

$$S = (K \ln P) \mu_4 V_p \exp\left(-\frac{\mu_4}{A}\right) \quad [15]$$

(where $\mu_4=0$ is conventionally chosen in correspondence to the beginning of the transformation, in AGN-s, of physical space into matter, i.e. after fresh gas begins to come out of AGN-s). In this equation K is Boltzmann constant, P is a parameter which indicates the disorder degree existing in the positions and motions of the material particles present in the region (and practically depends on the number of these particles) and A is a parameter strictly related to the maximum value that entropy can reach in the region during the evolution.

Equation [15] is similar to the Boltzmann equation with the adding multiplicative term $\mu_4 V_p \exp\left(-\frac{\mu_4}{A}\right)$ (related to the stream of material changes happening in ATPS). It

allows to explain and reproduce the increase of entropy of matter after fresh gas begins to come out of AGN-s (i.e. during the evolution of the universe corresponding to the formation of nuclei, atoms, stars and planets); at the same time, it allows to explain and reproduce the decrease of entropy concerning the evolution of life and conscious species in the regions of the universe which have similar physical circumstances to the earth. In other words, formula [15] shows that the two main tendencies – above cited - that one can single out in the universe can be, in a certain sense, “unified” in a one universal process: here chemical evolution and biological evolution (characterized by a decrease of entropy) are a direct continuation of the “physical” evolution, namely of the processes of formation of nuclei, atoms, stars and planets (characterized by an increase of entropy).

It is also important to underline the role of the parameter A , and thus the importance of the maximum value that entropy can reach in the region of ATPS under examination during the evolution. Grandpierre showed recently that in the universe the increase of entropy generates further possibilities that are favourable for biological organization, that it can enhance biological organization (9). This implies that the increase of entropy, and the consequent maximum value that entropy can reach in a certain region, play an important role in order to have a significant biological evolution in that region. One can therefore

suggest that a significant biological evolution can happen (and can be characterized by all the phases until the development of life and of human being) only if entropy can reach a certain threshold value, and this will be just the maximum value that the entropy (of matter) can reach in the regions of the universe which have similar physical circumstances to the Earth. It is therefore legitimate to think that when the stream of material changes happening in a given region of ATPS can reach the value represented by the parameter A , in that region biological evolution and development of life can happen.

Grandpierre has pointed out that entropy is intimately connected with a reality much more comprehensive than the realm of material processes: namely, with the reality of the individual possibilities (9). But – we suggest – the possibilities which can occur in a certain region of universal space depend on the material changes happening in that region. In fact, according to our view, the biological evolution can take place in a given region of ATPS only if the material changes in that region reach the value A . In this way, it seems permissible and formally elegant to express the entropy of a given region of ATPS in terms of the stream of material changes happening in that region.

On the ground of equation [15], one can now draw the following important results as regards the evolution.

In the centre of AGN-s, when density of the elementary constituents of ATPS in the area inside the Schwarzschild radius is at its maximum, energy of physical space begins to transform into energy of material particles ($\mu_4 = 0$). In this initial situation, the entropy of the generic region of the universe is equal to zero (which is its minimum value). Then, for $\mu_4 > 0$ the elementary constituents of ATPS begin to transform into material particles. The first particles to form in ATPS are quarks and leptons (i.e. particles devoid of internal structure). Therefore, in this first phase of evolution strong interaction among quarks is the prevalent ambient situation and as a consequence we have the formation of nuclei. With the formation of nuclei, as in ATPS there are nuclei and electrons, ATPS assumes the special state represented by the electromagnetic field (in particular, the coulombian potential) acting between nuclei and electrons and this peculiar interaction gives origin to atoms. With the formation of many atoms, ATPS tends to assume the special state represented by the Van Der Waals interactions acting between atoms and this leads to the formation of molecules. In other words, with the presence of many atoms, a-temporal physical universe enters in the phase of chemical evolution which leads to the formation of more and more complex chemical aggregates. Finally, as underlined before, chemical evolution is the beginning of the negentropic process of biological evolution (when the stream of material changes reaches the threshold value A): with the process of chemical evolution we have also the formation, in the whole observable space, of the basic organic molecules necessary for the development of life.

During the processes of formation of subatomic particles, nuclei, atoms, molecules, stars and planets (i.e. until the beginning of chemical evolution), on the ground of equation [15] the entropy of the generic region of the universe increases and reaches its maximum

$S_{\max} = (K \ln P) \frac{A V_p}{e}$ for $\mu_4 = A$, which is just the numerical order of changes corresponding to the beginning of chemical evolution (situation in which the amount of matter is at its maximum, in other words is in equilibrium with the density of physical space existing inside AGN-s). Then, for $\mu_4 > A$ with the process of chemical evolution we have at the same time the formation of organic molecules: therefore in the universe also the biological evolution

begins and there form cellules, pluricellular beings and living organisms (in the regions which have similar physical circumstances to the planet earth). Equation [15] implies that for $\mu_4 > A$ (and thus during the biological evolution) entropy starts to decrease. One can predict that at the limit of bigger and bigger numerical order of changes, i.e. with the evolution of human being and his consciousness, entropy tends to become smaller and smaller. In particular, one can say that in the phase of conscious experience of man (i.e. $\mu_4 \rightarrow +\infty$), entropy will tend to zero.

In synthesis, according to our a-temporal view of the universe, the processes occurring during the evolution can be summarized in the following entropy diagram (fig. 1), which shows that the evolution of life can be seen as a continuous negentropic process that develops towards the non-entropy state of ATPS.

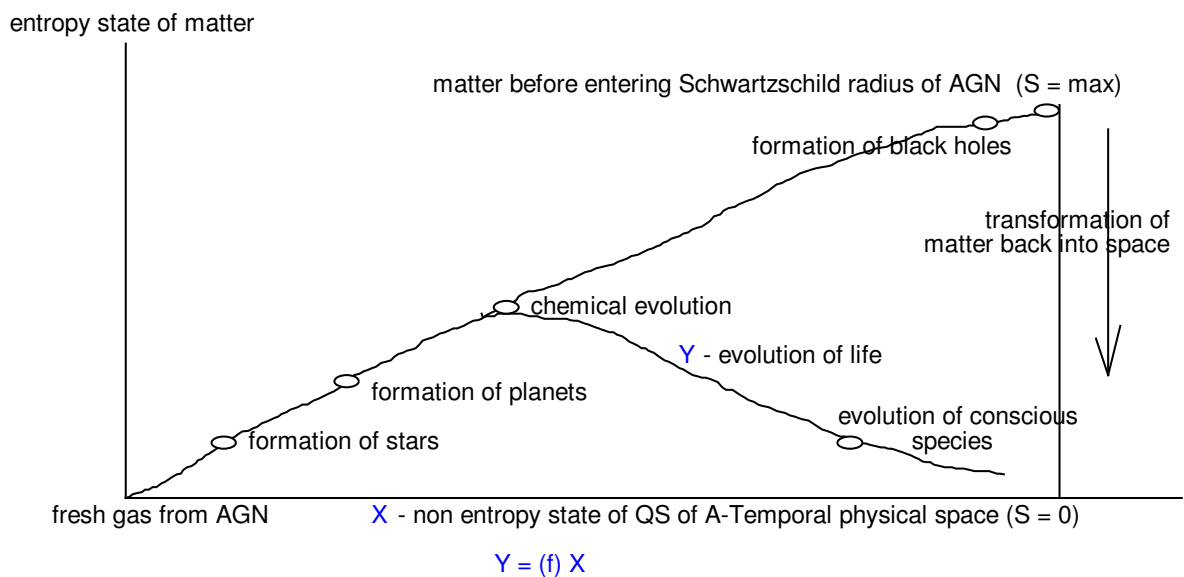


Fig. 1: In an a-temporal model of the universe (in which the active galactic nuclei are the renewing systems of the universe) the entire process of evolution (beginning with the formation of stars and planets and proceeding with chemical evolution and biological evolution) develops toward the non-entropy state of a-temporal cosmic space. The evolution of life and of conscious species can be seen as a consistent part, a continuation of the evolution of the universe.

On the ground of the model here proposed, the non-entropy state of ATPS can be therefore considered the “fundamental driving force” of the evolution. One can say that the non-entropy state of ATPS is a “physical environment” in which matter has a continuous tendency to develop towards conscious species. Physical evolution, chemical evolution, biological evolution and conscious evolution of man can be considered processes generated by the non-entropy state of ATPS. In fact, during the first phases of evolution of the universe corresponding to the transformation of energy of the physical space in energy of the matter (i.e. until the beginning of chemical evolution), the entropy of the universe tends to increase from zero (i.e. the state of ATPS) to the values of the entropy of matter. Then, with the beginning of the chemical evolution, which leads to the formation of organic molecules and therefore determines also the biological evolution of the universe (in the regions which have similar physical circumstances to the Earth), entropy tends to decrease and, at the limit, will approach to zero (characterizing ATPS) with the evolution of the human being and his development beyond the mind.

Universe is physically homogeneous. ATPS has the same physical properties in the whole universe. By considering the non-entropy state of ATPS as its driving force, evolution can be understood as an universal process, as an integral part of cosmic dynamics (7, 10).

Conclusions

Several experiments show that the functioning of living organisms is related to the gravitational field and thus to the universal space. They suggest that the evolution of living systems goes towards an increase of mass, an increase of internal energy and a decrease of entropy. It seems that cosmic space plays an active role in the evolution of life. Between living organism and cosmic space there is an active exchange of energy. Cosmic space has no entropy, evolution of life can be seen as a continuous negentropic process which develops towards the non-entropy state of cosmic space.

Besides, on the ground of an a-temporal model of the universe (in which the active galactic nuclei have the role to keep the universe young), it opens the possibility that evolution of life can be seen as a continuation of the evolution of the universe. By introducing a term depending on the material changes in Boltzmann formula, one obtains a new general formula for the entropy which can explain and reproduce both the increase of entropy during the evolution of matter and the decrease of entropy concerning the evolution of life. This model implies that the non-entropy state of the energy of a-temporal cosmic space can be seen as a driving force of the evolution.

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