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Physical Space, Entropy And Life

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Abstract: In the universe physical space and matter are in dynamic equilibrium. The universe is a self-renewing system with a total entropy that sums to zero. Evolution of life is a consistent part of the evolution of the universe.

Key words: physical space, gravitation, dynamic equilibrium, AGN, entropy, life.

Introduction

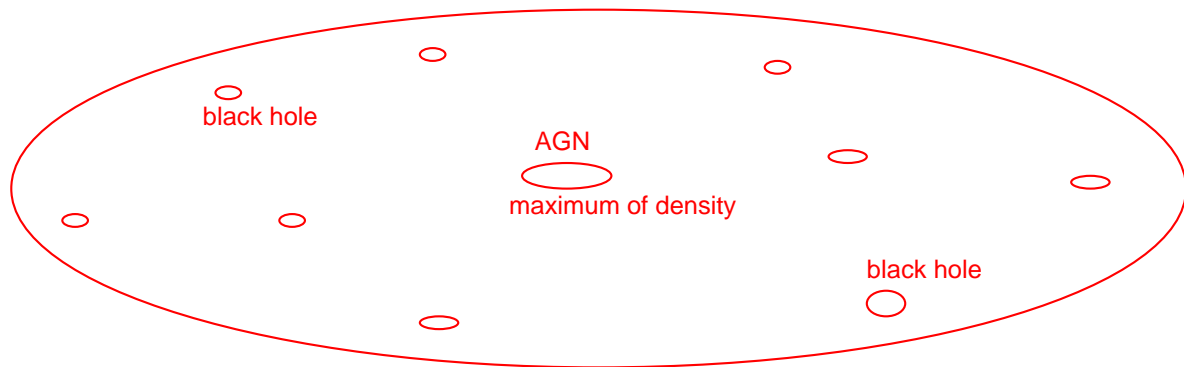
Einstein emphasizes in his work (1918-1930) that space has its physical properties; gravitational force was attributed to space. He says: "No space or portion of space (can be conceived of) without gravitational potentials; for these give it its metrical properties without which is not thinkable at all. The existence of the gravitational field is directly bound up with the existence of the space".¹

According to this understanding, the "curvature of space-time" is only a mathematical description of physical space and can not carry gravitational force. To carry gravitational force physical space must have some physical properties, a certain "density" that corresponds to the density of matter. The more dense the matter, the more dense the physical space. The "density of physical space" can be described in general relativity (GR) with the curvature of space. The "areas" of higher density attract each other.² Newberry considers that curved space and dense space are mathematically and geometrically equivalent.³ The original idea that space is dense was presented by Siepmann in 1999.⁴

Physical Space and Matter

Density of the physical space between galaxies is at the minimum, in the centre of an active galaxy density of physical space is at maximum. With the density of matter and density of space, can be explained astronomical observations which show that the Active Galactic Nucleus (AGN) continuously emits fresh gases. Energy can not be created and not destroyed. The matter can not simply appear in AGN out of nothing and disappear into black holes into nothing. The idea here is that in black holes energy of matter transforms into energy of physical space. This process keep high the density of physical space in the centre of the galaxy where energy of space structures back into energy of matter. The original idea of the transportation of the energy of matter through kind of tunnels that connect black holes and white holes is from Einstein and Rosen. Here AGN functions as a white whole.

ACTIVE GALAXY



AGN-fresh gas-formation of stars and planets-black holes-AGN

In active galaxies there is no singularities, there is only transformation of the energy where local non-equilibrium appears. One local non-equilibrium are black holes. In black holes gravitational force is so strong that disintegrates all elementary particles into energy of physical space. Second non-equilibrium are AGN. In AGN there is no matter, it is only high dense space. This local non-equilibrium allows transformation of physical space back into elementary particles. One could imagine that active galaxies are doing kind of circular breathing: breathing in through black holes and at the same time breathing out through AGN.

The transformation "matter--space--matter--space--matter" is permanent, the AGN is the "rejuvenator" of matter. In the galaxy, matter and space are in dynamic equilibrium. Dynamic equilibrium (DE) is a basic universal law. DE between space and matter is recreating the universe, DE between gravitational and tangential forces make it possible for planets to orbit around the sun, for the sun to orbit around the centre of the galaxy, the water circulation "ocean--evaporation--clouds--rain--rivers--ocean" is in DE, life chains of fauna and flora are in DE.

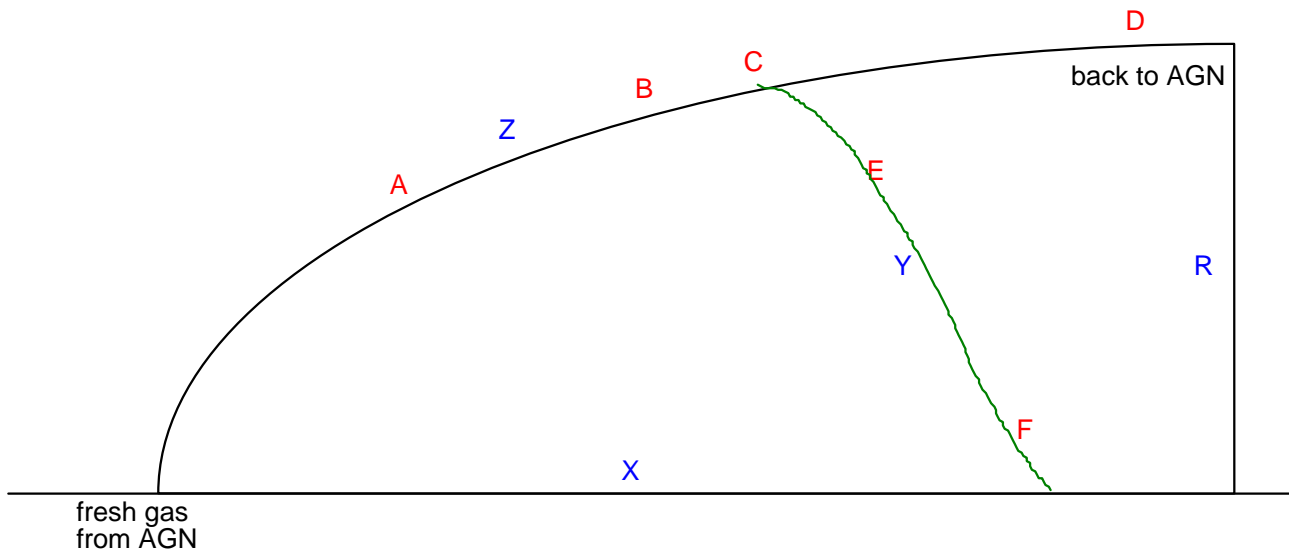
The majority of cosmologists still consider the "red shift" as proof of the expansion of the universe, but they accept that part of the "red shift" is a result of the light "escaping" out of the strong gravitational field of the galaxies from which it comes to reach Earth. Bolognesi and Van Flandern's view is that the red shift is not proof for an expanding universe, moreover several discoveries confirm the opposite.⁵

The Entropy of the Galaxy and the Evolution of Life

The galaxy is a "perpetual" system. It does not need energy to move with. It cannot be compared to the machines created by man where "for some work to be done some energy is needed". The second law of thermodynamics cannot be applied to describe universal dynamics. It is valid only for machines. The total energy of the universe and of a single galaxy sums to zero. In AGN "old stars" transform into fresh gas. An increase of the entropy of gas being produced in AGN does not influence the total entropy of the galaxy. AGN function as a rejuvenator of the galaxy.

Also for the movement of a stellar object no energy is needed. For example the force of attraction between physical spaces of the Earth and Moon is equal to the centripetal force which pulls the Moon from the Earth [$F_{\text{attraction}} (F_a) = F_{\text{centripetal}} (F_c)$]. For the movement of the Moon around the Earth no energy is needed [$F_a - F_c = 0$]. By moving the stars and planets the universe does not get "tired". Movement is its intrinsic property.

In the self-renewing galaxy the evolution of life is a consistent part of the evolution of the galaxy. It can be understood as a process that is continuously developing towards a total entropy of the galaxy that sums to zero. The relationship between life as a continuous negentropic process and the zero entropy of the galaxy can be described with the following diagram:



- X stands for a total entropy of the galaxy that sums to zero
- Y stands for the evolution of life
- Z stands for increasing of the entropy of matter
- R stands for the renewing process of "old" stars into fresh gas in AGN
- A stands for creation of stars
- B stands for creation of planets
- D stands for old stars
- C-E stands for chemical evolution
- E-F stands for biological evolution
- F-- stands for evolution of conscious being

According to this understanding evolution of life on the planet Earth is part of the evolution of the galaxy "Milky Way". This idea is supported by the discovery of basic organic molecules necessary for the development of life in the whole of observable space. Universal space is in the phase of chemical evolution which on the Earth and similar planets has continued into biological evolution. Astronomers discover many planets similar to the Earth. Life could also develop there. All over our galaxy and also in other galaxies life is developing towards conscious species. Probably we are not alone in this vast universe. (6)

Several experiments confirm that functioning of living organism is related to the gravitational field, which means to the physical space. Spaceflight induces a cephalad redistribution of fluid volume and blood flow within the human body and space motion sickness, which is a problem during first few days of spaceflight, could be related to these changes in fluid status and in blood flow of the cerebrum and vestibular system. (7)

In weightlessness there is a decreased activity of spinal ganglia neurons of the hypothalamic nuclei producing arginine, vasopressin and growth hormone releasing factor. Structural changes of the somatosensory cortex and spinal ganglia suggest a decreased afferent flow to the somatosensory cortex in microgravity. The results characterise the mechanisms of structural adaptation to a decreased afferent flow in microgravity by the neurons in the hemisphere cortex and brain stem nuclei. So, under microgravity there is a neuron hypoactivity. (8)

Experiment carried out at the University of Lubiana, Slovenia in 1987-1988 with Californian worms (Latin name is: *Lumbricus Teresticus*) shows that the weight of living Californian Worms is greater than of the same dead ones; gravitational force is stronger on the living worms than on the same dead ones. This means that physical space is more dense around a living organism than around a dead one. Physical space plays an active role in the functioning of the living organisms. This means that also in the evolution of life physical space presents an active component (9).

Conclusions

The universe has no beginning and no end, it is a self renewing system. Evolution of life is a consistent part of universal dynamics.

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