NATURAL ENERGY-ELEMENTAL PROCESSES IN NANO (DNA)-MICRO-MACRO-MEGA (GALAXY) LEVEL SYSTEMS

Bobukh L.V.*, Morgun M.P., Bobukh T.A., Sivolap T.N., Kovalenko N.G.
National Metallurgical Academy of Ukraine, Gagarina Av. 4, Dnipropetrovsk, 49005, Ukraine
E-mail: toees@mail.ya.ru

Introduction

National Research Council of USA has formulated 10 main questions geologists and planetologists are trying to answer at the beginning of 21 century. Among others, appeared the questions: *How did life come to existence? * How does life influence the Earth and how does the Earth influence life? Authors proposed the main statements of the concept of natural organization of living systems by inanimate nature n work [1]. Also, complex influence of components: E- energy, C- components, V- velocity, S- configuration of the way in the process of transformation inanimate- living. Mainly, processes of nano (DNA) - micro (cell) – macro (organism) level biosystems organization were considered.

Results and Discussion

Connections between natural mechanical motion of mega- level (Galaxy) system and energy-elemental processes of organization and functioning of bio (H,C,O,N) – systems are being explored. Up-to-date level of development of space science ensures knowledge of main parameters (space, time, mass) and working characteristics (C, E, S, V) of natural system (the Universe).

Galaxy

Space: "Stellar wheel". Diameter of galactic disc is 30 kiloparsec (100 thousand light years). *Time.* 10 billion years.

Mass. Galaxy contains no less than 100 billion stars (total mass is ~ 10^{11} Sun masses), interstellar material (gas, dust, mass of which is ~ 0,05 mass of all stars).

S (*way configuration*). Distance between accumulations of galaxies increase because of metagalaxy expansion.

V (*velocity*). Galaxy motion rigid relative to relict radiation at a rate of 620 km/s.

E (energy). Total gravitational field of galaxies. Cosmic rays, magnetic fields, radiation (photons). *C (component)*. Interstellar material mainly consists of hydrogen and helium. Upon the average there are 100 helium atoms per 1000 hydrogen and 2-3 atoms of all elements that are more heavy (generally- oxygen, carbon, nitrogen). Specks of dust of Interstellar material consist of compound of graphitic and silicate particles, covered with shells of organic molecules and ice. Mean radius of specks of dust is less than micrometer.

Sun

Space. Radius is 696 thousand km. Distance from the center of the galactic disc to the Sun is – 8 kiloparsec (25 thousand light years).

Time. 5 billion years.

Mass. $2 \cdot 10^{30}$ kg.

S (way configuration). The Sun rotates around the galactic nucleus and its own axis.

V (velocity): Galactic year (period, Solar system makes a revolution around the galactic centre) is approximately 230 million years. Linear velocity is 220 km/s. For the time the Sun exists it made 30 revolutions. Period of proper rotation is 27 days. Linear equator particle velocity is 2 km/s.

E (energy). Source of energy of the Sun is nuclear transformations of hydrogen to helium, which activate thermal, luminous, electromagnetic radiations.

C (component). Hydrogen, helium.

Earth

Space. Mean radius is 6371,032 km.

Time. 4.7 billion years.

Mass. $5976 \cdot 10^{21}$ kg**.**

S (way configuration). The Earth rotates around the Sun and around its own axis.

V (velocity). Earth year (period, the Earth makes a revolution around the Sun) is 365 days 6 hours 9 minutes 9 seconds. Linear velocity is 29,765 km/s. Sidereal day (period, the Earth makes one revolution around its axis) is approximately 23 hours 56 minutes 4 seconds. Angular velocity (turning angle for a time unit) is

same for any place on the surface of the Earth – 15 degrees/hour, but linear velocity differs: it is 465 meters per second on the equator, moving off from it we can see linear velocity decreasing to 0 meters/sec on the geographic pole.

E (energy). Gravitation, electromagnetic field of the Earth, other influences that can be described as energy. Peak surface temperature reaches 57-58 ºC (in tropical deserts of Africa and North America), minimum – close to -90 ºC (in central parts of Antarctica). *C (component).* Hydrosphere of the Earth consists of water. Atmosphere of the Earth consists of air – mix of gases – nitrogen (78.08%) and oxygen (20.95%), the rest are - water vapor, carbon dioxide, noble and other gases.

This is a representation of a small piece of recent knowledge about the Universe, but even this list provides insight into complexity of its arrangement and functioning of this natural system. Powerful energy (E), giant mass of substance (C) is in constant helical, cyclic (S) movement (V) at all levels of space. Complex rotation of different galactic objects (around their own axes and around bigger objects) evaluates the complex nature of equilibrium trajectory of systemic action (Fig. 1).

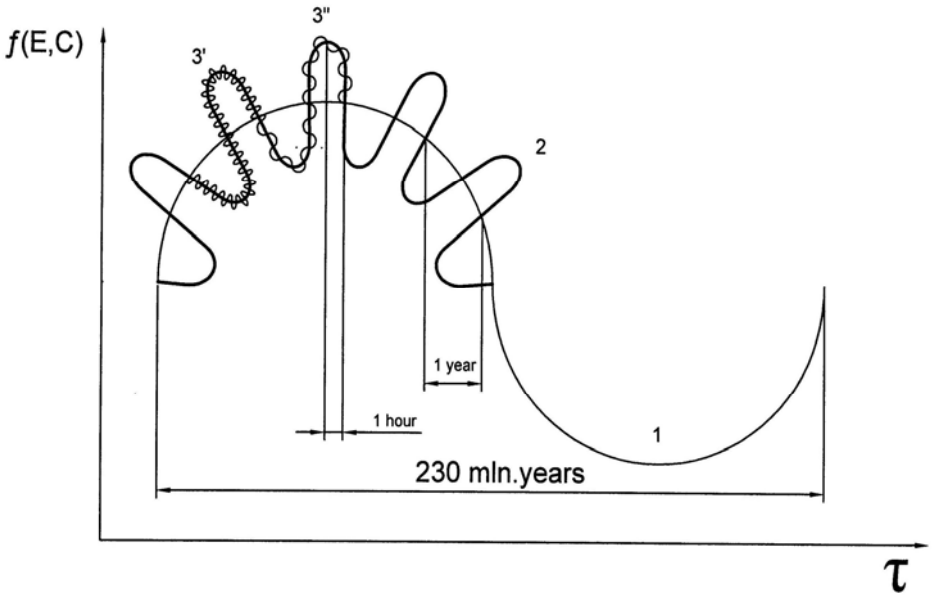

Fig. 1. Equilibrium trajectory of changes in the energy- elemental condition of an arbitrary point on the surface of the Earth, activated and provided by mechanical movement of the Earth around the center of the Galaxy (1), the Sun (2), its own axis (3).

Conclusions

1. *f* (E,C) – a universal function of energy-elemental state of system is developed. Using this function for studying systems and processes of nano (DNA)- micro- macro- mega (Galaxy) level gives opportunity to portray unity (interconnection, correlation, transformation) of living and inanimate objects.

2. Main points of functioning of natural system (Galaxy) producing bio (H, C, O, N) – systems are presented.

3. Life is presented as one of the forms energy- elemental processes organization, naturally taken by man as bio (H,C,O,N) – system of macro-level(organism), and developed by him at nano (DNA)- micro- macro- mega (Galaxy) levels.

References

1.Bobukh L. V., Dzhebyan I.E., Sivolap T.N., Bobukh K.A. Physicochemical basics of biosystem's organization and development. In: Baranowski, B.; Zaginaichenko, S.; Schur, D.; Skorokhod, V.; Veziroglu, A., editors. Carbon Nanomaterials in Clean Energy Hydrogen Systems. Proceedings of the NATO Advanced Research Workhop on Using Carbon Nanomaterials in Clean-Energy Hydrogen Systems, Sudak, Crimea, Ukraine, 22-28 September, 2007. Netherlands: Springer. 2009, XXXIV, P. 879–890.