

# Synergetic Model of the Universe

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## Abstract

The model of the Universe as a large self-organizing system is discussed. The process of self-organization in it leads to the formation of a hierarchy of nested increasingly complex systems. Following the elementary particles are systems with significantly increased complexity and degree of order. This atoms, chemical molecules, and then information (or cybernetic) systems - biological molecules, live cells and multicellular organisms. Next come the humans, family, clan, tribe, people, nation, civilization. Matter of the Universe also has a hierarchical structure, quarks, hadrons (protons and neutrons), atoms, molecules, etc. up to clusters of galaxies. The scale of this sequence increases as geometrical progression. The model allows to combine into a single system of knowledge from all partitions: space-time physics, elementary particle, nuclear and atomic physics, inorganic and organic chemistry, biochemistry, bio-evolution. the sciences of man and society, including the history of the evolution of human consciousness and cognition, stringing all of them on the general core of the universe evolution.

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## Introduction

The term "Synergetics" was proposed by the outstanding German theoretical physicist, professor at the Institute for Theoretical Physics, University of Stuttgart [\*Hermann Haken\*](#). This term is derived from the notion of Synergy or synergism from Greek *συνεργία* (*synergos*) or acting together. It means the combined impact of two or more factors, in fact really their combined effect can be much greater than effect of each individual component and their sum. For example: a knowledge and efforts of several people are organized in such a way that they are mutually reinforcing. Another example: the profit after the merger of the two companies exceeds the sum of the profits of these companies before the merger.

Synergetics initially appeared as a theory of self-organizing of rather simple nonlinear physical systems such, as a laser, for example. It is rather easy to write for them the systems of differential equations and its solutions are represented as a family of curves depending on the initial conditions. In some cases such solutions, regardless of the initial conditions converge at one point as, if it would *attract* them [1]. Such points of stability were named *attractors*. In case of instability there are two (or more) such points instead of one. In this case, depending on the random values a system can roll into one of them. Borderline instability was called a *bifurcation point* [2]. Thus, the main feature of self-organizing systems is the ability to process the transition from chaos to order.

Later appeared that in this way can be described much more complex systems, such as biological, animal populations, and even human society [3]. The higher is complexity of systems the more difficult is to describe them mathematically. However laws of transition processes from chaos to an order are the same, so it is possible to make qualitative consideration. In this case, synergetics smoothly passes into the philosophy and concepts such as attractors and bifurcations acquire not mathematical, but philosophical meaning. Nevertheless, there is no sharp boundary between them from: if today we can offer only a qualitative consideration, maybe tomorrow somebody will be able to calculate all this more precisely. So we can say, for example, that the primary DNA molecule, which was the first living organism capable of creating copies of itself, was an attractor all previous evolution at the level of organic chemistry, *Metazoans* was an attractor for single-celled stage, and the *Homo Sapiens* was an attractor for *Mammillae* evolution.

## Self-Organizing Universe

It was found further that self-organizing ability is the fundamental property of our extending Universe as a big system. It is connected with its nonequilibrium and its openness [4] (external environment for it is the physical vacuum, generated it, and as it was found recently [5], it is responsible for its further expansion).

The most interesting variant of such philosophy can be realized if we consider the whole Universe as a big self-organizing system [6]. The process of evolution in it leads to certain hierarchy of systems nested one inside another [7]. They become more and more complex and their scale increases. In the first moment of the Universe life elementary particles arise as a result of the polarization of the physical vacuum. After this systems appear with a certain structure and the ability to store an information. These are atoms, chemical molecules, and then more complex systems - biological molecules, viruses and bacteria, that have not only DNA molecules, but their protective shells as well. The following step was an occurrence of a nuclear cell, and *Me-tazoans*. Above are animals, *Homo Sapiens* and human social formations: families, clans, tribes, nations and civilizations. The substance of the Universe has also hierarchical structure: quarks, hadrons (protons and neutrons), atoms, molecules, etc. up to congestions of galaxies, and the scales in this sequence increases as geometrical progression.

Human society has arisen within the global *biosphere* and now takes on the attributes of the global *noosphere*. For today it is the complex and largest of all currently known organized cybernetic systems, which is approximately in the middle of this hierarchy - its size is correlated with the size of atoms about the same as the size of the *Galaxy* with the size of the *Earth*. So it is possible to assume creation in a long perspective much more organized and larger intellectual communities, which can already leave scales of our *Galaxy*, gradually covering the whole *Metagalaxy*. After such transition to a higher level the systems possess other properties and significantly higher opportunities, than each of elements included in it, but each element loses a part of its freedom degrees. It still has some freedom degrees, but already limited by requirements of stability for the whole more complex system. Thus, we can conclude that the development of life in the universe leads to the creation of more and more organized systems of increasing scale, which is seeking to fill the whole of it completely. Today *Humanity* is facing a step towards a global civilization and the continuation of this process for a long future compels us to assume the organization of larger *post-human communities* on a cosmic scale as attractor of the of the whole previous *human society* development.

Thus the new philosophical system under construction as a history of self-organizing process in our Big Universe or Big Universe History [8]. First of all it allows you to perform one of the main goals and tasks of philosophy - to combine into a single system of knowledge from all partitions physics of space-time and elementary particle, nuclear and atomic physics, inorganic and organic chemistry, biochemistry, bio-evolution up to the humanities and social sciences, including the history of philosophy as a part of the history of the evolution of human consciousness and knowledge, all of them strung on a general core of the Universe evolution. All previous philosophical systems were constructed intuitively and are connected with of their author names. In contrast of them synergetic philosophy is created by efforts of many philosophers and scientists like a science. Each scientist brings back his contribution as a brick, and these bricks fit together if they are received in accordance with the same rules, as is customary in science (pseudo-science unlike science breaks these rules and their cobbles are not suitable for constructing a harmonious and majestic building science).

In the XIX and early XX centuries it was believed that the only process, that occurs in our universe, is the moving to heat death with an increase in *entropy*, but in the late twentieth century, it was discovered that there is also a process in the opposite direction, namely, self-organization with increasing of *negentropy = information* [9]. As far as since time immemorial, the main goal of life is a struggle for survival its ability to solve increasingly more and more complex problems and tasks increases in the development process. The same situation is in sports or computer games, all this development can be shared into certain levels or rounds, which on the one hand provide new opportunities, but on the other hand, face other, further complicate the problems. Each higher level is *attractor* for the previous levels, but not every gamer or team are lucky enough to get to the next round. Recent scientific data do not contradict the hypothesis that life arose on Earth and Mars at the same time, but then because of rather small planet size of Mars and its rapid cooling it stopped its existence there [10]. So not all the teams will be able to qualify for the next round, giving them new opportunities and facing them even more and more complex problems. Hence we can conclude that the

meaning of life and the preceding species to directly or indirectly contribute to the success of his team (in our case - a terrestrial civilization) thereby enabling winnings for the entire the universal civilization as whole. This way it looks here like not only consistent growth of complexity of the system, but also the development of its goals. So we can conclude from this that *Sense of Human Life* is to increase the *order* in the world.

### **Superattractor of the evolution**

Each higher level is *attractor* for the previous levels, but what is the *superattractor* of all this evolution? It can be *an absolute knowledge* or *an absolute order*. Following to Socrates we can call it as "*Absolute*" or "*the Highest God*". As an attribute of *God* he exist outside of time and space as practically unattainable theoretical limit of self-organization on the one hand it does not exist as an unattainable limit, but on the other - since we are talking about it means it exists. People with traditional image of *God* will be dissatisfied with this new concept of *God*: they want to see certain mysterious or sacral sense to communicate with him. However, if we introduce in a scientific picture of the World a certain object having some features, inherent to traditional concept the *God*, why it is impossible to concern him as something almighty, mysterious or sacral? In fact we do not know, what actually corresponds to the given object though some features of him thus are slightly opened for us already now, at least soon we will be able to communicate with developed Artificial Intellect (AI) as with a *God* not highest, but higher level. This concept correspond to ideas of Jantsch [5] and Alexander Bolonkin [11] that *God* is an *Intellect of the Universe*, but not a *Creator*.

It is possible also to approach to concept of "*God*" from another hand. One of the "evidence" of its existence is an argument that there is any reason usually lies outside the system in which its effects are manifested. Looking to the root of causes, we come to what is the external original cause of existence of the Universe – is so-called false physical vacuum with positive density of energy, which created our Universe. Vacuum density is currently sufficient for the accelerated expansion of created by the vacuum itself material substance by means of antigravity influence. Surprisingly, this effect is one-sided: the vacuum affects all material substance in the universe, while it does not affect him. There are some assumptions about complex hierarchical structure of the vacuum with ability for its own self-organizing [12]. It is possible, that the information or knowledge is collecting right into the vacuum. Then it turns us to pantheistic model of "*God*" as *vacuum superattractor*. It is interesting that occultists have very similar notions considering that each point of space contains the full information about past and future. It is possible to believe in it until it will be corrected or denied by the Science, but in any case even the simple superattractor model of "*God*" has rather interesting consequences. In particular, it allows to receive very simple and effective wordings for such notions as the *Sense of the Life, Goodness and Evil*.

### **Sense of Life, Goodness and Evil, Humanity and Hellish Ideology**

Using the concept of "*God*" entered above, we receive, that *sense of the life is in a movement to the "God"*, i.e. very similar to representations of Christians or yoga, but the difference seems to be rather essential: it is impossible to come to "*God*" alone by self-improvement, because all the system as a whole goes to the attractor and the way up to "*God*" is still very far. Self-improvement is thus only means for the most effective self-realization. Self-improvement in professional and other spheres, including spiritual, gives development of individual abilities and potential resources, and also their using in creative activity as a way to realization of its chance to make our life not only most charged and interesting, but also with a greater benefit for our team - progressive mankind, moving to "*God*". Moreover, if you managed to rise on a scale of spiritual and intellectual perfection even on a step higher than your parents, then you will create the best starting conditions for your children. Such a process of intellectual and spiritual development of society is similar to a concept of east philosophy: improving yourselves and your descendants, you indirectly promote to progress of all community as a whole. It is possible to say that main *sin* of man is nothing doing or making regress and damage.

Having risen mentally to the level of self-organizing process of Big Universe, it is possible to say, that: *Goodness is something that helps a system to move to "God" and Evil is an Antipode of Good.* If we, however, go down to a level of biological beings actually parasitizing inside terrestrial biosphere, for example: wolf and hare, human and virus at first sight concepts of good and evil seem to be here relative: what is good for a virus or a wolf, that is bad for a human and a hare and vice versa. However, having risen up to the ecosystem level, we can see that wolves are useful for a population of hares as a whole, catching the weakest and sick. Without them hares would start to die out from illnesses. Human stands undoubtedly much closer to "God", i.e. is incomparably more complex and advanced system, rather than a wolf or a virus, therefore an attack of animal on us or virus infections is doubtless evil. On the other hand, if they were not, the human population would be defenceless before predators and is not trained to resistance for new diseases. The same is possible to say about such other negative phenomena, as computer viruses, terrorism and other criminality. The result correlates well with Hegel law *of unity and struggle of opposites*: in everything, even very bad and awful is necessarily presented something positive and vice versa. From here the conclusion is: *an Evil never can disappear completely, so the task of more advanced system is constantly to trace, suppress and whenever possible to control activity of less advanced systems, using them in its interests, reducing to minimum any possible damage from them.*

In our body it is the task of an immune system, but at a level of the states the law machinery solves it. During all history of a human society there was a severe competition for the right to be at the place of more advanced system. Now this struggle goes on, but nowadays the world goes to a *global civilization* as a new kind of a civilization. For its construction it is necessary to use another human behavioral program instead of program of severe competition. It is the *program of unification and cooperation* that is underlying *humanity* or *humanism*. Attempts to manage without it nowadays lead to *fascism* which connects technical achievements of a liberal-humanistic civilization with *antyhumanistic ideology*. Here were *Nazism, Japanese imperialism, communism and Islamic fundamentalism*. Until now, these attempts had a fiasco because of the advanced development of scientific, technological and military capabilities that liberal - humanistic civilization gave ensuring freedom of self-realization of their citizens. It is very difficult to deals with an organized crime and terrorism, but there are no other ways except to trace them and to suppress. Thus, the humanism does not assume the full refuse of violence, but an application of it is possible only for protection of a humanistic civilization against those who has not risen to this level yet, leaving for them an opportunity to rise.

Supporters and opponents of globalization must also answer the question: whether globalization itself evil or goodness? Similar questions arise about the development of nano- and biotechnology, cloning, the creation of artificial intelligence and forming on their basis of a new *post-human civilization*. Synergetic philosophy provides a general answer: goodness is that promotes or helps the system to move to "God."

The system approach allows understanding as well origin and sense of ethical standards and laws which in the beginning were made a single whole. In a primitive society infringement of unwritten rules or *taboo* was punished rather severely, as a rule, by death. Division into ethics and laws has arisen only in Christian culture as a result of connection of judiciary practice and well developed system of the Roman right with the idealized ethics first Christian communities, based on such Jesus sayings as: *Do not judge and you will be not judged! Let throw the first stone to whom, who has no sin!* That means that any person is responsible before the *God* only and people can not judge to each other. Thus, the Roman legislation took only part of such universal rules of behavior as: *Do not kill, do not steal, do not commit perjury*, etc., having left others: *Do not commit adultery, wish good to everyone and love yours enemies*, etc. to conscience of the person. From the point of view of the systems theory and synergetic *laws and ethical standards are necessary restrictions of freedom of egocentric individuals for the sake of stability of the whole society as a system of higher level*. So according to the previous definition, to follow them is *goodness* and their contravention is *evil*.

## Secularization of Religion

Earlier only religion answered for similar questions although it could not answer on a question: «why?». Nowadays the synergetic philosophy gives answers for all of them. Entering in it the concept of "God", it is possible not only to simplify the formulations, determining sense of life, goods and evil, having made their clear for both believers and for non-believers. Such kind the synergetic can be used as a basis for creation a new *secular religion* which according to some scientists should be the Faith based on knowledge instead of dogmas. The fact is that our knowledge is always limited, and we have to anyhow add them with some *Faith*. If *Faith* is free of dogmas, it possesses an opportunity to develop in process of growing of a knowledge level, not entering in insoluble contradictions with them. If it does not change, it becomes stagnant and decrepit. Then, instead of helping people, it will bring them harm. To ensure that a human person does not become a slave his faith, he must constantly be in doubts primarily about his own rightness of their views of the world and be prepared for their refinement and revision, if there are new facts that do not fit into former notions. The main religious denominations, that have arisen in the pre-scientific era, in order to obtain, the opportunity for self-development, like science does it, should be abandoned from the rigid dogmatism, and use current knowledge and historico-philosophical approach to revise their ideological foundations, while maintaining the foundations of their traditional rites.

Lutheran theologian Dietrich Bonhoeffer (1906-1945), executed by the Nazis shortly before the end of war, already in prison, introduced the new concept of "non-religious Christianity" [13]. He clearly states the inevitability of the process of secularization: a modern "matured" a world where Man has learned to do on their own without the involvement of "working hypothesis of the *God* existence" is not worse than he did before, fully trusting in *God*. He can not accept any dictates of the church, nor traditional religion with its view of *God*, inheriting archaic consciousness idolaters. So today many priests in the West are beginning to recognize that *God* can be interpreted as an abstraction rather than a supernatural force. So some British *chaplains* believe that in the XXI century *Anglican church* may remain without *God*, at least in its former sense.

It possible to be included in such a philosophy not only scientific religion, but the ancient idea of the abyss and reincarnation of the soul. Because the soul actually is a set of behavioral programs and databases essential part of which is transmitted to offspring with genes, and thus it can not only be passed from father to son, but can also be a lot of Multiples multiplied. A very close understanding of soul evolution an Indian philosopher and founder of his own method - integral yoga had Sri Aurobindo [14], combined an ancient concept reincarnation and Karma law with ideas of evolution and a heredity theory. We are born not only with all the information about our structure, which has been written down in our genes, but also with a certain software set. As a matter of fact this set is that primary "*soul*", which required for normal activity of both computers and alive organisms. During our life the new additional information is processed in our brain and accumulated in our operative memory, thus "*soul*" self-develops in a similar way as computer training programs. On the basis of the acquired life experience sensual, and for human still conscious model of the world arises, which after death of a living organism as well as at computer shutdown disappears, apparently without a trace, if it has not previously been recorded in long-term memory. The only real way to rescue our soul is to transfer our genetic information to our children, and to transfer our knowledge to them or to another people. Nowadays we know how difficult our world is arranged, and how this knowledge differ from naive ideas of people who lived thousands of years before us.

Synergistic approach considers any entity in its development from its origins to its prospects in the future. Therefore, nowadays a growing number of papers devoted to the synergetic approach for research the historical process, the evolution of consciousness and morality in human society, as well as the crises in the world civilization, where the main processes taking place considered as an alternation of chaos and order. The following issues of this publication will be devoted to discourse of these problems.

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