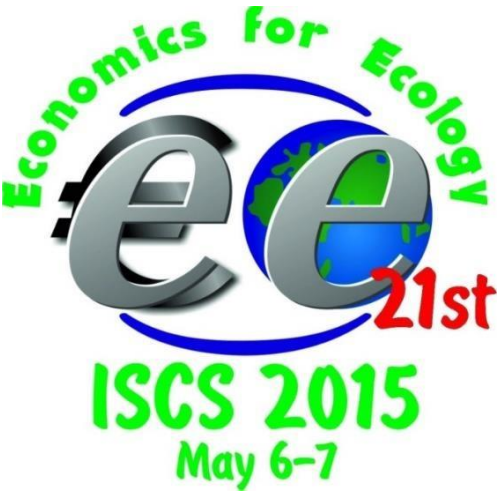
Ministry of Education and Science of Ukraine
Sumy State University. Faculty of Economics and Management
Sumy Local Youth NGO "Council of Young Scientists"

21st International Scientific Conference
"Economics for Ecology"
ISCS'2015



Економіка для екології

Матеріали
XXI Міжнародної наукової конференції

(Україна, Суми, 6–7 травня 2015 року)

Суми
Сумський державний університет
2015

ORIGIN AND REASONS OF SYNERGY ESTABLISHMENT

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In modern science there are several definitions of synergy as a science of self-organization. Well-known scientist I. Pryhozhyn, one of the founders of synergistic research, believes that this science should be defined as "theory of dissipative structures", while in the US the same science is called a "theory of dynamic chaos" (M. Feigenbaum), in Latin America - theory autopoeza (self-construction, self-reproduction of living beings) (U.R. Maturana). In our literature it becomes increasingly oftener found and more applied.

The ambiguity of terms and definitions is not coincidental. Synergy is a young science, characterized by deep learning of phenomena and comprehensiveness. It requires both philosophic understanding and knowledge of modern mathematics, physics, biology, computer science, human and society sciences, knowledge of modern technology of production of consumer goods and so on.

In the 80-ties of the last century synergy gained considerable impetus helped by opening opportunities and ways to transition from order to chaos and vice versa. Eminent scientist D. Ryuel noted the fact that the study of chaos as a phenomenon has become necessary in all fields of science.

Today, scientists in all fields of science point out, that modern ideas for solving problems of modern science have had their philosophical and sometimes practical implementation in the works of scientists, who lived many centuries ago. Ancient philosophical movements of Eastern world, Asia, Tibet, have an extensive theory of chaos, self-organization and so on. There is a fair question about the validity and necessity of comprehensive development of such theories with the help of modern mathematical and physical, computer-oriented methods. This situation makes it possible to conclude on common ideas of mankind for solving many problems and phenomena. Thus, the idea of common origins and ideas of synergy, that formed both thousands years ago and now, today, become obvious.

The first reason why the synergy, which is built on the achievements of modern science, uses and draws conclusions basing on centuries-old knowledge is a common subject of analysis. Complex systems of self-organization are studied. Internal characteristics of the system acquire special meaning as a source of self-development.

The second reason is a new look at a problem of the whole and partial. Philosophers of ancient Greece believed that part of a whole is much simpler and if you learn its properties you can understand the properties of the whole.

However, in their further researches, scientists have concluded that, generally, object (process, phenomenon, etc.) acquires new qualities and properties, other than those that its part has. Therefore there is a need for new scientific approaches based on a study of the impact to the whole of every its part.

The third reason of synergy establishment is the need to develop such strategy of study of complex systems (which usually describe phenomena, processes), which would coordinate methods for studying of simple systems in accordance with the laws of nature with the methods of studying of complex systems and the ability and need to anticipate and predict the development of phenomena, events, and their results.

In synergy there are equations in partial derivatives widely used. These equations are a tool to study processes, where parameters vary not only in time but also in space. Therefore, any field of study can be the area of research of synergy. A common feature of phenomena and processes, that synergy studies, is examination of irreversible processes dynamics and fundamental innovations emergence.

However, status of synergy as a science still gives rise to a variety of opinions and attitudes of scientists. According to Yu.L. Klimontovych, author of the theory of statistical self-organization: “Synergy is not a new science, but it is a new direction in science that brings together diverse fields of expertise. The purpose of synergy is to identify common ideas, common methods and common patterns in the various fields of natural science and sociology.” In 1982, associate of USSR Academy of Sciences M.V. Valkenstein, on the first USSR Conference on synergy, identified synergy as a new world view that is different from the Newtonian classicism.

Ability to design and calculate mathematically complex system is closely related to the computing processes and computer technologies. Thanks to these latest achievements, prediction horizons have expanded greatly and provide opportunities for the researcher to ask and get the desired results in the required horizons, logs, and sometimes in quite distant future.