Editor in Chief

IVANOV Petr Matsovich – Doctor of Technical Sciences, Professor, Academician of the Russian Academy of Natural Sciences, Scientific Director of the Federal Scientific Center "Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences", Honored Scientist of the Russian Federation, Laureate of the USSR Council of Ministers Prize. He is the author of 130 scientific works, 8 monographs and 5 inventions.

P.M. Ivanov began his scientific career at the Institute of Cybernetics of the Academy of Sciences of the Ukrainian SSR, where he studied at graduate school and worked as a researcher from 1965 to 1972. His interests were connected with the applied theory of algorithms, mathematical modeling of complex systems and the development of automated regional management systems using automatically -algebraic formalisms developed by him.

P.M. Ivanov obtained fundamental results in the theory of algorithmic algebras (AA). The problem of axiomatization of both the algebra of conditions and the algebra of operators in the AA system was solved. It was proved that the collection of all identities AA is generated by a finite number of schemes of conditional identities. The completeness and consistency theorems of the axiomatic systems he constructed for noncommutative algebras of conditions and operators were proved. The algorithmic solvability of the equivalence problem for expressions in commutative algebras of conditions and operators was proved. An algorithm for the synthesis of discrete converters was developed.

In the 70s, his research interests were focused on the development of automated control systems (ACS) of different levels (starting from the enterprise level and ending with the regional, republican and Union levels). On the basis of these developments, P. M. Ivanov in the early 80s, for the first time in the USSR, implemented a system of regional online data processing technology covering all areas for the Kabardino-Balkarian Autonomous Soviet Socialist Republic.

In 1981 his book "ACS of production and technical support of agriculture", which set out the methodological, mathematical, informational and technical fundamentals of creating integrated ACS of regional levels was published. On the basis of mathematical and information-technical developments of P.M. Ivanov the ACS of the regional system of material and technical supply of the national economy of the republic was created.

For the creation of these control systems on the basis of domestic equipment at the regional, republican (RSFSR) and Union levels Ivanov P.M. in 1984 he was awarded the title of Laureate of the Prize of the Council of Ministers of the USSR for Science and Technology.

Research on the creation of integrated ACS led him to the need for scientific work on the automation of the design of such complex systems. As part of the development of theoretical design methods for integrated regional automated control systems P.M. Ivanov proposed a methodology for structural-algorithmic analysis and synthesis of complex control systems, as a result of which management systems of great complexity become the subject of system analysis. These works formed the basis of his doctoral dissertation: "Structural-algorithmic design of integrated ACS with diversified complexes", which was defended in 1986 at a specialized dissertation council at the Institute of Cybernetics of the Academy of Sciences of the Ukrainian SSR.

From 1986 to 1990, P.M. Ivanov, concurrently, conducts scientific and pedagogical work, being the head of the Department of Computer Engineering and Automation of Production Processes at the Kabardino-Balkarian Agricultural Land-reclamation Institute. In 1989 he received the title of professor.

Ivanov P.M. headed and implemented the project "Creating a training ground for the development and application of advanced information technologies within the framework of regional network structures (information support for the region's management system in the new business environment)" in accordance with Decree of the USSR State Committee for Science and Technics of July 27, 89 No. 502/90 "On Conducting competition of projects within the framework of "Advanced Information Technologies" State Project.

Subsequently, scientific problems, developed by Ivanov P.M. are associated with the search for effective methods of mathematical modeling of complex control systems. To describe the heterogeneous elements of complex systems (CS), heterogeneous mathematical formalisms are usually used, which complicates the search for mechanisms to describe the interaction of these elements.

P.M. Ivanov developed a method for a uniform description of CS elements in the form of a single module, for which a dynamic system was selected covering both deterministic and stochastic objects. As such a module, he proposed an automaton-algebraic model for which it is possible to automatically convert both a discrete converter and a probabilistic automaton to the form defined by this model.

P.M. Ivanov proposed an algebraic universal scheme describing a wide class of real systems and processes. At the same time, it becomes possible (due to the algebraic nature of the models) to formalize the domain of equivalent transformations of both CS elements and conjugation schemes of these elements, which is still an undeveloped field and therefore is a fundamentally new result.

In order to describe stochastic processes in AA language P.M. Ivanov proposed a stochastic operator in the algebra of AA operators and a method for regularizing an operator implemented by a probabilistic automaton. Using these results, he showed the possibility of describing complex systems in the economy, using the AA language.

P.M. Ivanov first introduced the concept of fuzzy AA with fuzzy logic to describe decision-making processes in the face of uncertainties and fuzzy defined procedures. For fuzzy algebras, he proved the assertion that for any fuzzy automaton, one can find the regular expression of (fuzzy AA) operator realized by this automaton. Modeling complex systems using the AA language forms a new scientific field, called by the author algebraic modeling of complex systems. The use of these abstract algebraic methods in the optimization of algorithms, characteristic of the modern stage of development of the applied theory of algorithms, is of fundamental importance in creating optimal control systems and their algorithmic structures. The indicated new scientific direction is reflected in P.M. Ivanov's "Algebraic modeling of complex systems" M.: Science. Fizmatlit, 1996. – 272 p.

In the books "Regionalization of Management and Sustainable Development" (Nalchik: Elbrus, 1996. – 130 p.) And "The North Caucasus: the party of war and Russia's interests (problems of sustainable development of the region)" (Nalchik, KBSC RAS, 1997. – 226 p.) the problems of regional management and sustainable development of Russia and the regions are being developed.

As part of the team of authors P.M. Ivanov published "The Concept of State Information Policy". – M. ISA RAS, 1999.

Many scientific results obtained personally by P.M. Ivanov are included in the "Main Results of the RAS" Reports for the corresponding years.

One cannot fail to note the multifaceted scientific interests of P.M. Ivanov.

His fundamental scientific research is not limited to work only in computer science, mathematics and cybernetics. Scientific interests of P.M. Ivanov encompasses a wide range of scientific studies in areas that are far from computer science and mathematics: economics, state building, civilizational paradigms, conflict studies, political science and international relations.

Thus, the fundamental works of P. M. Ivanov were widely recognized in the country and abroad. in the directions:

economic-mathematical models: "Sustainable regional development: concept and management model" – Economics and mathematical methods. V. 42. No. 2. 2006;

civilizations: "Russian Civilization: Ethnocultural and Spiritual Aspects":

Enz. Dictionary / Ed.col .: Mchedlov M.P. and etc.; Aut.col .: Andreev A.L. et al. – M.: Republic, 2001. – 544 p.;

state-building: "What should federalism be like in Russia tomorrow?" –

Federalism, No. 3, 1999;

conflictology: "Can conflicts in Russia be avoided?" – Bulletin of the Russian Academy of Sciences. 2002. V. 72. No. 1.;

political science and international relations: "Clash of Civilizations or Sustainable Development?" POLICY. Political research. 2015. No. 2.

This work was also published in the USA under the heading “Contribution to the International Economy”: Vol. 1. No. 4. 2015. ISSN No. 2377-1682. Published by York University Inc.

On his personal initiative, six research organizations (institutes) were created:

1. Information and Computing Center of the State Committee for Agricultural Machinery (1973);

2. North-Caucasian scientific-design and technological association “Sevkavagroprom ASU”, as part of the Computing centers of the agro-industries of Dagestan, North Ossetia and Kabardino-Balkaria (1988);

3. The Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences (KBSC RAS) including six research organizations (1993);

4. Institute of Mountain Ecology, KBSC RAS (1994);

5. Institute of Informatics and Problems of Regional Management of KBSC RAS (1996);

6. Institute of Applied Mathematics and Automation of the KBSC of the Russian Academy of Sciences by converting the self-supporting IAMA of the State Higher Education Committee of the Russian Federation into an academic one (1993).

He was Chairman of the KBSC RAS from 1993 to 2018. At present, he is the Scientific director of the KBSC RAS. At the same time, he worked for 20 years as a director of the Institute of Computer Science and Problems of Regional Management of the KBSC RAS.

Ivanov P.M. headed the dissertation council, specializing in Economics and National Economy Management.

In 2011, under the scientific supervision and with the direct participation of P.M. Ivanov, the “Development Strategy of the Kabardino-Balkarian Republic until 2030” was developed and presented to the Government of the KBR.

P.M. Ivanov was the first to formalize the concept of sustainable development using automaton-algebraic systems and defined a new scientific concept of sustainable development, which laid the foundation for the corresponding comprehensive interdisciplinary research.

In 1990, he was elected a full member (academician) of the Russian Academy of Natural Sciences, in 1995 – academician of the International Academy of Sciences (Munich), in 2017 – academician of the Oxford Academic Union.

P.M. Ivanov is the chairman of the Public Council under the Government of the KBR for scientific and technological development. In 2016 he was awarded the highest award of the republic – the Order “For Merits to the Kabardino-Balkarian Republic.”