# Professor Vladimir Alekseevich Emelichev
## On the occasion of His 90th birthday



Vladimir Alekseevich Emelichev was born on 10th of August 1930 in a small town of Makaryev in Kostroma region of the Russian Federation. He graduated with honors from the Department of Physics and Mathematics, Ivanovo Pedagogical State University with major in mathematics (1952) and then from the postgraduate school at the same institute (1955) majoring in algebra (supervised by the famous Soviet algebraist, academician Anatoly I. Maltsev).

V. A. Emelichev received his doctoral degree in physics and mathematics in 1963, and defended his Doctor Habilitatus thesis in 1973. In 1976, he became a Full Professor. In 1998, Emelichev was awarded the State Prize of the Republic of Belarus in science and technology together with His co-authors for their very important monograph on graph theory.

V. A. Emelichev began his academic career as a teacher in Shuya State Pedagogical University and the Vladimir branch of the Moscow Institute of Electronic Engineering. In the 1960s, he moved to Minsk, the capital city of Republic of Belarus, to continue in top academic institutes such as the Belarusian State University (professor, department head), the Belarusian State Polytechnic Institute (professor), and the Institute of Economics and Mathematical Methods

of Planning at the State Planning Commission (department head, deputy director for science).

Nowadays, V. A. Emelichev is recognized as one of the most influential Belarusian scientists in the field of mathematical cybernetics, a person, who created a national school of specialists in discrete optimization, polyhedral combinatorics and graph theory. His pioneering methods of discrete optimization were the response to the needs of the planned economy for systems of industrial automation. Together with his students and colleagues, Emelichev visited enterprises across the Soviet Union, built up models of production processes and supply chains, and developed methods meant to optimize them. That work was accompanied with the in-depth elaboration of new theories and methods in the respective fields. Among the most important results of V. A. Emelichev in the field of the modern theory of discrete optimization we can list the following ones:

- creation and justification of a method for constructing a sequence of plans for solving a wide range of discrete optimization problems, on the basis of which effective algorithms for solving applied problems of optimal planning and control are developed;
- investigation of the combinatorial properties of the set of feasible solutions of both general and special optimization problems, in particular various types of transport polyhedra, which are used to construct effective methods for solving linear and discrete programming problems;
- construction and development of the mathematical apparatus and methodology in the field of analysis of complexity, solvability, stability, as well as scalarization and regularization of vector discrete optimization problems with various optimality principles;
- development of a constructive approach to the quantitative stability analysis of vector discrete optimization problems, which resulted in obtaining formulas or achievable estimates of the stability radius of such problems.

Vladimir Alexeevich Emelichev has been very successful in sharing and transferring his knowledge. During his academic career, Emelichev successfully promoted 37 doctors of sciences (of seven were thereafter habilitated), and reviewed more than 150 theses. Many of his former students now work in academia around the world. The list of his scientific works contains more than 400 titles, including four (co-authored) monographs, translated into English and German, namely:

Emelichev V. A., Kovalev M. M. and Kravtsov M. K.: *Polyhedrons, graphs, optimization.* Moscow, Science. 1981. 344 pp.;

Emelichev V. A. and Komlik V. I.: *Method for constructing a sequence of plans for solving discrete optimization problems.* Moscow, Science. 1981. 208 pp.;

Emelichev V. A., Melnikov O. I., Sarvanov V. I. and Tyshkevich R. I.: *Lectures on graph theory.* Moscow, Science. 1990. 384 pp.;

Emelichev V.A., Zverovich I.E., Melnikov O.I., Sarvanov V.I. and Tyshkevich R.I.: *Graph theory in tasks and exercises.* Moscow, Book House "LIBRO-COM". 2013. 416 pp.

For many years, Professor Vladimir A. Emelichev has been a member of the editorial boards of the scientific and theoretical journals such as:

*Discrete Mathematics* (Russian Academy of Sciences, Russia);

*Cybernetics and Systems Analysis* (National Academy of Sciences of Ukraine);

*Bulletin of the Academy of Moldova. Mathematics* (National Academy of Sciences of Moldova).

Currently, V.A. Emelichev is Professor Emeritus at the Department of Mathematical Cybernetics of the Belarusian State University. Until the beginning of 2020, he has been developing curricula and giving lectures in discrete mathematics, operations research and optimization. He continues research work, publishing new papers each year, mainly in collaboration with his students. Many of them regularly visit him even after many years from graduation, as he continues to teach and inspire.

As a "thank you" to our teacher and friend, several of his former students contributed to this special issue: Olga Karelkina (Minsk, Belarus), Yury Nikulin (Turku, Finland), Dmitry Podkopaev (Warsaw, Poland), and Ali Ramazanov (Baku, Azerbaijan) as authors; Evgeny Gurevsky (Nantes, France) and Kirill Kuzmin (Atlanta, USA) as reviewers. One of the papers is actively co-authored by Vladimir Emelichev himself (for whom this special issue comes, indeed, as a surprise).

On the 90th anniversary, we send our best greetings and sincere wishes to the jubilee celebrant. We wish Vladimir Emelichev many more years of a prosperous life and good health.

Yury Nikulin and Dmitry Podkopaev
Guest Editors