
GENNADII FEDOROVICH FILIPPOV (to the 80th anniversary of his birthday)



On March 26, the known physicist-theorist, Dr. Sci. in Physics and Mathematics, Professor, the Head of the Department of Structure of Atomic Nuclei at M.M. Bogolyubov Institute for Theoretical Physics (ITP) of the National Academy of Sciences of Ukraine (NASU), the winner of the K.D. Sinelnikov Prize of NASU Gennadii Fedorovich Filippov was 80 years of age.

Gennadii Fedorovich was born in Moscow in a family of employees. In 1956, he graduated with a honor degree from the Faculty of Physics of the Moscow State University, being commissioned to the enterprise “Post Box 150” (Chelyabinsk, Russia), where he had been working as a physicist-theorist for more than ten years. In 1960, he successfully finished the postgraduate study at the Faculty of Physics of the Moscow State University and defended his Ph.D. thesis.

At the beginning of his scientific activity, Gennadii Fedorovich carried out a series of works in the theory of collective excitations of atomic nuclei. A model of non-axial nuclei, which he proposed together with Academician A.S. Davydov, gained a wide international recognition and became known in the world literature as the Davydov–Filippov model (Zh. Eksp. Teor. Fiz. **32**, 945 (1957)). His researches in plasma physics were also recognized (see, in particular, a pioneer work on the quasilinear approximation by Yu.A. Romanov and G.F. Filippov, Zh. Eksp. Teor. Fiz. **40**, 123 (1961)). The important results were obtained by Gennadii Fedorovich while studying the stability and the uniqueness of self-similar solutions of hydrodynamic equations.

After leaving for Kyiv in 1966, G.F. Filippov began the theoretical researches concerning the structure of atomic nuclei and the nuclear reactions at the newly founded Institute for Theoretical Physics of the NASU. He proposed new asymptotic methods for studying the properties of the bound state in atomic nuclei. Those works composed a basis of his dissertation for the doctoral degree, which he defended in 1970.

In 1974–1996, Gennadii Fedorovich lectured at the Faculty of Physics of the Taras Shevchenko Kyiv National University. Since 2004, he gave lectures for students at the scientific and educational center of the ITP. He is a member of the editorial board of international journal “Yadernaya Fizika” (Nuclear Physics).

At the beginning of the 1970s, Gennadii Fedorovich proposed a new original approach in the microscopic theory of collective excitations in atomic nuclei. This approach – known now as the method of generalized hyperspherical functions – opened a way for the substantiation of phenomenological collective models on the microscopic basis. For the first time in the framework of the microscopic theory, the complete set of collective and internal variables was properly determined, and the required set of quantum numbers that govern the vari-

ety of collective and internal excitations in a system of identical particles was established.

For the monograph written by G.F. Filippov, V.I. Ovcharenko, and Yu.F. Smirnov "Microscopic Theory of Collective Excitations in Atomic Nuclei" (Naukova Dumka, Kyiv, 1981), Gennadii Fedorovich was awarded K.D. Sinelnikov's Prize of the NASU. This book was translated into English and became known to experts in many countries.

In 1980, Gennadii Fedorovich formulated an algebraic version of the resonating-group method, which provided wide possibilities for the researches of the structure of light atomic nuclei and nuclear reactions of various types. In the framework of this method, he and his disciples examined a number of nuclear reactions, which are of both fundamental and applied importance, for instance, for astrophysics and controlled thermonuclear synthesis. A further development of the algebraic version enabled the nature and the properties of bound states and states in the continuous spectrum of nuclei with a large excess of protons and neutrons to be studied.

When, owing to the improvement of experimental facilities, the interest in the structure and properties of nuclei far from the beta-stability valley arose, the range of problems dealing with exotic nuclear systems became the major subject matter for the Department headed by G.F. Filippov. The structures of a lot of nuclei with an excess of neutrons were studied by Gennadii Fedorovich and collaborators of his department within the algebraic version of the resonating-group method, which turned out fruitful for the solution of such problems.

The development of the microscopic theory of nuclear reactions and the engagement of many-particle generating functions while implementing this theory made it evident that the generating parameters are independent variables of the wave functions determined in the Fock-

Bargmann space, i.e. in the phase space, where the study of phase trajectories of nuclear systems is convenient. This fundamental result obtained by G.F. Filippov enabled the analysis of properties of the effective interaction between clusters in two- and three-cluster systems, which emerges as a result of the nucleon exchange between clusters, when the distance between them diminishes, to be fulfilled.

Nowadays, the Department of the Structure of Atomic Nuclei headed by Gennadii Fedorovich Filippov for more than three decades continues the scientific researches in the following directions: the microscopic theory of light nuclei and nuclear reactions, the theory of collective excitations in atomic nuclei, and the dynamics of multi-channel and multicluster configurations in light atomic nuclei.

Under the supervision of Gennadii Fedorovich, several Doctor's and a considerable number of Candidate's theses were defended. The geography of places, where his disciples work, is amazing: from Mexico to Japan.

G.F. Filippov is a person, who extremely devoted himself to science. He combines such character traits as intelligence, goodwill, and high exactingness to himself and his colleagues and disciples.

G.F. Filippov meets his 80th anniversary full of creative power. He continues to work actively and fruitfully for the development of the world science. The scientific community sincerely gratitudes Gennadii Fedorovich with this anniversary and wishes him a sound health, inspiration, and new creative achievements.

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