

Dmitrii Vasil'evich Shirkov (on his sixtieth birthday)

N. N. Bogolyubov, A. A. Logunov, and M. A. Markov

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On 3 March 1988 Dmitrii Vasil'evich Shirkov, a prominent Soviet physicist, Corresponding Member of the Academy of Sciences of the USSR, head of the theoretical physics laboratory sector of the Joint Institute for Nuclear Research will have reached his sixtieth birthday.

His scientific biography began already from the time of his studying at the physics faculty of the Moscow State University. The first cycle of Shirkov's investigations that was carried out at the end of the 40s—beginning of the 50s relates to the problem of the diffusion and slowing-down of neutrons in complex media.

D. V. Shirkov became well-known through his work devoted to the foundations of quantum field theory: the constructive formulation of the scattering matrix, the creation of the method of the renormalization group, the theory of dispersion relations. These methods which were entirely new at the time, and later occupied the central position in the arsenal of theoretical physics were included in the monograph by N. N. Bogolyubov and D. V. Shirkov "Introduction to the theory of quantized fields". It appeared in its first edition in 1957 (and soon after that in the USA and France), and until now has remained a ready reference for field theory specialists.

Since the middle of 1957 Shirkov began working at the theoretical physics laboratory of the JINR. To this period belong his papers on the application of the method of the renormalization group to the theory of superconductivity. The results of this work were incorporated in a monograph "A new method in the theory of superconductivity" published in 1958 together with N. N. Bogolyubov and V. V. Tolmachev.

In 1960 Shirkov was selected a Corresponding Member of the Siberian Branch of the Academy of Sciences of the USSR. He founded the division of theoretical physics at the Institute of Mathematics of the Siberian Branch of the Academy of Sciences of the USSR and was put in charge of the department of theoretical physics of the new Novosibirsk University.

Shirkov's scientific interests were concentrated at that time in the field of dispersion theory of strong interactions at low energies. Already at the end of the 50s he proposed at the JINR the method of obtaining integral equations for partial scattering amplitudes free of internal contradictions. Its application to pion-pion scattering—the central problem of strong interactions—gave to him and his pupils the possibility to describe consistently the phenomenon of the ρ meson, to predict the large value of the phase of the singlet s -wave, and to discover the universal short-wave repulsion. The papers of this series were summarized in a monograph by D. V. Shirkov, V. V. Serebryakov and V. A. Meshcheryakov "Low-energy theories of strong interactions" published in 1967.



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During this period D. V. Shirkov devoted considerable attention to scientific-organizational activity. He headed the council on theoretical physics of the Siberian Branch of the Academy of Sciences of the USSR, which coordinated the work of all the theoreticians of the Siberian Branch of the Academy of Sciences, and he conducted periodical "Siberian conferences" on the physics of strong interactions.

Starting with 1971 Shirkov resumed work at Dubna. His scientific interests became concentrated on the high-energy asymptotic behavior of different quantum field-theoretic models, and the improvement of the apparatus of the renormalization group. Shirkov's investigations laid the foundation for the well-known series of papers by Dubna theoreticians devoted to calculations in higher orders of perturbation theory in quantum chromodynamics and supersymmetric theories. Shirkov and collaborators developed a method of summing asymptotic (divergent) series which has turned out to be very effective, for example, in the φ^4 model and in the procedure based on it for determining critical indexes of phase transitions.

Evaluations of higher-order diagrams stimulated Shir-

kov's interest in the possibility of carrying out algebraic transformations directly using electronic computers. On Shirkov's initiative a number of systems to carry out analytic computations most suitable for calculations in quantum field theory was introduced in Dubna. The well-known review by D. V. Shirkov *et al.* in *Usp. Fiz. Nauk*, organization of regular conferences and seminars on this subject in Dubna and at the Moscow State University served to popularize and spread the use of analytic systems. In recent years Shirkov has been developing a general overview of the nature of the renormalization group transformations in different fields of theoretical physics. He has introduced the concept of functional scaling, which generalizes the concept of power-law scaling.

Shirkov has transferred his pedagogical activity into the department of quantum statistics of the physics Faculty of the Moscow State University. On the basis of lecture courses he has produced the textbook "Quantum Fields" (in collaboration with N. N. Bogolyubov). Among those educated

by D. V. Shirkov there are doctors and candidates of science, well-known scientists, directors of scientific teams both in our country and in other countries of socialist cooperation.

D. V. Shirkov is a member of the executive of the Division of Nuclear Physics of the Academy of Sciences of the USSR, and a laureate of both Lenin and State prizes. As a member of the Communist Party of the Soviet Union since 1953 he has been involved in extensive social activity, and has been elected in the course of the last decade and a half as a deputy to the Moscow regional council. His scientific and public activity has been recognized by the award to him of two Orders of the Red Banner of Labor, the Order "Badge of Honor" and the Order of Cyril and Methodius I Class of the People's Republic of Bulgaria. We would like to wish him further scientific and pedagogical achievements, and the realization of all his creative aspirations.

Translated by G. M. Volkoff