

Dmitriï Vasil'evich Shirkov (on his seventieth birthday)

The 3rd of March marks the 70th birthday of the distinguished Russian physicist Dmitriï Vasil'evich Shirkov.

An extremely important role in D Shirkov's formation as a scientist is attributed to his teacher Nikolaï Nikolaevich Bogolyubov with whom he began to work as a student of the Physics Faculty of Moscow State University.

The first cycle of works begun by D V Shirkov at the Institute of Chemical Physics of the USSR Academy of Sciences and continued at the nuclear centre in Sarov (formerly Arzamas-16), was aimed at simplifying Boltzmann kinetic equation for the problem of neutron transfer in complex media. Later, he used these results to develop important applied projects. For one of them, the development of the thermonuclear weapon, he was awarded the Order of the Red Banner of Labour. Another project, nuclear charge, which was realized under the leadership of M A Lavrent'ev, brought him the Lenin Prize for 1958.

In 1955 D Shirkov carried out research into fundamental theoretical physics at the Steklov Mathematics Institute and then at the Laboratory of Theoretical Physics of the Joint Institute for Nuclear Research (JINR) in Dubna from its foundation in 1956.

In the mid-50s D Shirkov continued working with N N Bogolyubov in quantum field theory and they formulated the renormalization group method. The monograph by N N Bogolyubov and D V Shirkov, 'Introduction to the Theory of Quantized Fields', became internationally recognized. First published in 1957, it underwent seven editions both in our country and abroad and still remains a manual for many generations of theorists.

At that time D V Shirkov wrote papers on the application of the renormalization group method in Bogolyubov's microscopic theory of superconductivity, the results of which were included in the book "A New Method in the Theory of Superconductivity" published in 1958 together with N N Bogolyubov and V V Tolmachev.

In 1960 D Shirkov was elected a Corresponding Member of the USSR Academy of Sciences. After his arrival in Akademgorodok (Novosibirsk), he founded the Theoretical Physics Department of the Mathematics Institute of the Siberian Branch (SB) of the USSR Academy of Sciences and the Chair of Theoretical Physics at Novosibirsk University. He contributed a lot to the organization of the All-Siberia school olympiads and to the Physics-Mathematics Boarding School at Novosibirsk University; he also headed the Committee for Education of the Presidium of the SB of the USSR Academy of Sciences.



Dmitriï Vasil'evich Shirkov

D V Shirkov's scientific interest at that period of time was in the dispersion theory of strong interactions at low energies. As early as the end of the fifties he suggested a method of deriving integral equations for partial scattering amplitudes, which was free from internal discrepancies. The application of this method in hadron physics was summed up in the monograph 'Low-Energy Theories of Strong Interactions' by D V Shirkov, V V Serebryakov and V A Meshcheryakov, published in 1967.

Nowadays, D V Shirkov's disciples are successfully working at the Sobolev Institute of Mathematics of the Siberian Branch of the Russian Academy of Sciences (RAS), Novosibirsk University, Irkutsk University and the Irkutsk Branch of the SB RAS.

At the beginning of the seventies D V Shirkov returned to JINR's Laboratory of Theoretical Physics, where he concentrated on the high-energy asymptotics of different quantum

field models and the development of the formalism of the renormalization group. His studies formed the basis of a well-known series of works by the Dubna theorists devoted to calculations in higher orders of perturbation theory in quantum chromodynamics and supersymmetric theories. D V Shirkov and his disciple Dmitrii Kazakov formulated the method of summing asymptotic (divergent) series, which turned out to be rather effective not only in quantum field theory but also in quantum statistical physics for the calculation of critical indices of phase transitions.

In the mid-seventies, it was D V Shirkov's idea to use computer-aided studies of complex algebraic and analytic transformations in theoretical problems. A number of 'Computer Algebra' systems were implemented at JINR, becoming most appropriate to make labourious calculations in theoretical physics. A well-known review by D V Shirkov and his colleagues Vladimir Gerdt and Oleg Tarasov, published in *UFN* in 1980, as well as his seminar at the Physics Faculty of Moscow State University and several All-Union conferences held in Dubna, spread the science of this type of analytical calculation system.

With the help of computer algebra D V Shirkov's group performed a series of calculations in higher orders of the perturbation theory of quantum chromodynamics and supersymmetry theories, which evoked a strong interest inside and outside this country.

In the early eighties Dmitrii Vasil'evich devised a general interpretation of the nature of renormalization group (RG) transformations in various fields of theoretical physics. Based on the RG he introduced the notion of functional self-similarity generalizing the exponential self-similarity, allowing the transformation of the RG method into a general method of mathematical physics and the derivation of new results, for instance, in nonlinear optics. In the eighties and nineties D V Shirkov organized a series of international conferences on the application of the RG method in various fields of physics, which demonstrated its versatility.

Since 1972 Professor D V Shirkov has been lecturing at the Physics Faculty of Moscow State University. His lecture courses formed the basis of the text-book 'Quantum Fields' (written with N N Bogolyubov), which underwent two editions in Russian and two in translation, and of the review book for students 'Theory of Particle Interactions' (written with his disciple Vladimir Belokurov), which was also translated into other languages. It was his idea to establish a series of monographs entitled 'Library of Theoretical Physics', of which he became the editor. It was aimed at introducing young researchers to classical monographs, which were barely available for the Russian reader at that time.

For the last quarter of the century D V Shirkov has been a member of the Bureau of the Nuclear Physics Division of the USSR/Russian Academy of Sciences, and a member of the Editorial Boards of a number of academic and foreign journals. He has been Director of the Bogolyubov Laboratory of Theoretical Physics (JINR) for the past five years. As the director, he contributed quite a lot to the promotion of the traditions of the Bogolyubov School in Dubna — to invite young researchers, preserve contacts with scientists of the FSU and to promote international collaboration. His civic responsibility, active position in defending scientific values and concern for the preservation of national cultural property are his most distinguishing features. In 1994, D V Shirkov was elected a full member of the Russian Academy of Sciences.

D V Shirkov's meritorious scientific activity was recognized with the Lenin and State Prizes, the title 'Honoured Scientist of the Russian Federation' and other high awards.

Among his disciples are doctors and candidates of science, well-known physicists, and leaders of scientific teams both in our country and abroad. Professor D V Shirkov heads a prominent scientific school, which has been awarded a grant of the President of the Russian Federation.

We wish Dmitrii Vasil'evich very good health, success in his scientific and educational activity and the realization of all his creative endeavours.

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