

vigorous growth of fundamental and applied research in these areas.

D V Skobel'syn's characterization as scientist, mentor, and science organizer would be incomplete if we forgot to mention his activities as science popularizer. He wrote a number of articles on various aspects of nuclear physics in the *Great Soviet Encyclopedia*, articles on the discovery of radioactivity, and articles about outstanding physicists.

Dmitrii Vladimirovich was a kind man, and was very attentive to the people around him. He knew and loved books and music (people say that he was in awe of Mozart's and Bach's music). Memoirs left by his colleagues and disciples tell us that he had a highly original personality, that the clarity of his mind, the crispness of his judgements, and his firmness in defending his views never left him until the very last days of his life.

Dmitrii Vladimirovich Skobel'syn belongs to the constellation of scientists of whom Moscow State University is proud. His name is inseparable from the epoch-making achievements of our country in the Soviet Atomic Project and in space exploration. The University remembers with deep gratitude the accomplishments of one of its greatest scientists. The scientific school that he created, his students, and the Institute bearing his name continue successfully the work that he started and to which he gave so much of his knowledge, strength of mind, and abilities.

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Academician D V Skobel'syn as the founder of the MSU school of nuclear physics

M I Panasyuk, E A Romanovskii

On February 1, 1940, Moscow State University (MSU) opened a Department of Atomic Nucleus and Radioactivity. Dmitrii Vladimirovich Skobel'syn, elected in 1939 to the USSR Academy of Sciences as a Corresponding Member, was appointed the Head. The department was established for training specialists in experimental nuclear physics. This essentially was the date when Skobel'syn started to build the scientific school of nuclear physics at Moscow State University.

Students majoring in theoretical nuclear physics were trained at the Department of Theoretical Physics. From 1925 till 1930 this department was headed by Leonid Isaakovich Mandelshtam, and from 1930 till 1941 by Igor' Evgen'evich Tamm. By the end of the 1930s and the beginning of the 1940s, a large group of students had graduated from the Department of Theoretical Physics and the experimental physics departments of the Faculty of Physics, which were close in their subject-matters to nuclear physics; later, they

contributed brilliantly to the expansion of nuclear physics. Among them were M A Leontovich, D I Blokhintsev, I M Frank, M A Markov, E L Feinberg, V L Ginzburg, V V Vladimirovskii, V S Fursov, A D Galanin, I N Golovin, A S Davydov, S Z Belen'kii, I I Levintov, F L Shapiro, Ya P Terletskii, G I Budker, and A D Sakharov.

It is well known that moving the Academy of Sciences from Leningrad to Moscow in 1934 and the transformation of the Department of Physics in the Institute of Physics and Mathematics of the USSR Academy of Sciences into the P N Lebedev Physical Institute of the USSR Academy of Sciences (FIAN) was of great importance for the further development of research in nuclear physics at MSU. The FIAN Director between 1934 and 1951 was Sergei Ivanovich Vavilov, who invited such prominent physicists as L I Mandelshtam, N D Papaleksi, G S Landsberg, I E Tamm, and M A Leontovich to FIAN from MSU; moreover, all of them after this transfer were allowed to combine research at FIAN with holding departments and lecturing to students in the Faculty of Physics.

S I Vavilov was also (temporarily) Head of the Laboratory of Atomic Nucleus at FIAN. Its staff included L V Groshev, N A Dobrotin, I M Frank, and P A Cherenkov. In 1935, having defended his PhD degree in Leningrad, S N Vernov became a doctoral candidate at FIAN (on the recommendation of Academicians S I Vavilov and V I Vernadsky) where he was doing research in cosmic ray physics under the guidance of S I Vavilov and D V Skobel'syn.

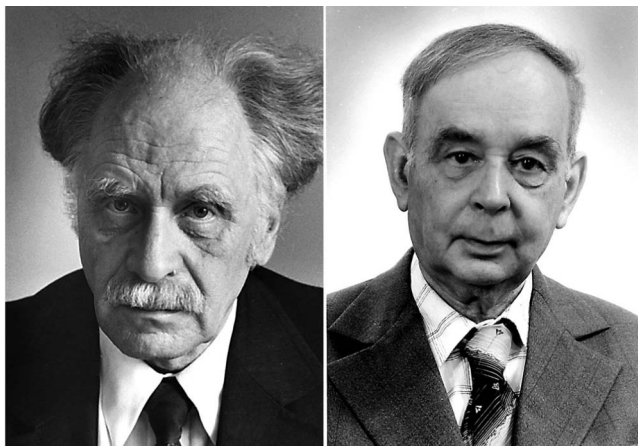
In 1938, D V Skobel'syn accepted S I Vavilov's suggestion to move to FIAN as leader of the research program in nuclear physics and cosmic rays. A memorandum sent from FIAN to the Presidium of the USSR Academy of Sciences, "On the organization of work for the study of the atomic nucleus in the institutes of the USSR Academy of Sciences", emphasizing the achievements of FIAN in the investigations on the physics of atomic nuclei, formulated a proposal to create, using FIAN as a base, a central academic laboratory with a powerful cyclotron, and the need to start training young nuclear physicists for this specialization. At the end of November 1938, the FIAN memorandum was discussed at a meeting of the Presidium of the USSR Academy of Sciences. One of the items in the Resolution of the Presidium of the USSR Academy of Sciences contained the following instruction: "MSU will prepare for the task of establishing the experimental department focused on the physics of atomic nucleus with an appropriate laboratory" [1].

In those years, A S Predvoditelev was the Dean of the MSU Faculty of Physics and Chairman of the Learned Council of the Faculty of Physics. He wrote to D V Skobel'syn on behalf of the Learned Council with a request to "take the trouble to organize the teaching of subjects essential for the atomic nucleus and radiology at the MSU Faculty of Physics", "to deliver a talk to the Council of the faculty on how the work on setting up the department of the physics of atomic nucleus is planned to unfold," and informed D V that "the administration of the university has already resolved the issue of organization of the department in the affirmative" [2].

In order to create a new department at MSU, it was necessary to have an order issued by the Committee on Higher Education Affairs of the USSR Council of People's Commissars (VKVSh under USSR SNK). In the years we are dealing with here, students of universities and of educational institutes were taught some aspects of nuclear physics within lectures on general physics. VKVSh and other organizations

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First professors of the Department of Atomic Nucleus and Radioactivity: S N Vernov (left), and I M Frank.

involved in making decisions vital for organizing this department had an extremely vague understanding of the significance of nuclear physics. D V Skobeltsyn and S N Vernov had to work extremely hard to achieve an affirmative outcome of the debate on the creation of the chair.

During the spring term of 1940, D V Skobeltsyn, and also (part-time) professors of the department S N Vernov and I M Frank, started lecturing students on two subjects specific to this department: the atomic nucleus physics, and cosmic ray physics.

The first graduation of students who majored in the atomic nucleus and radioactivity took place in June 1941, virtually on the eve of the Great Patriotic War. Diplomas were presented to ten graduates, among them O N Vavilov, N L Grigorov, G T Zatsepin, I A Kryukov, L G Mishchenko, and I V Estulin, who later tied the research activities with their work at FIAN or at the MSU Institute of Nuclear Physics (NIIYaF MGU).

The first graduates of the department received sufficiently good training in nuclear physics. Some of them made outstanding contributions to the progress in nuclear and atomic physics: G T Zatsepin (became a laureate of the Lenin and State Prizes), N L Grigorov (received the USSR State Prize and the distinction of Honored Scientist), I V Estulin, and G F Drukarev.

The evacuation of educational and research institutions from Moscow began in summer 1941. The staff of FIAN left for Kazan. In view of this, part-time professors and teachers were released from their duties at the University by the end of August 1941; on September 1, lectures and practicums were cancelled at many departments at MSU. In October 1941, the University also began its evacuation from Moscow.

On 28 September 1942, an order of the State Defense Committee (GKO) launched the work covering the Soviet Atomic Project. A special Laboratory of Atomic Nucleus was soon organized in the USSR Academy of Sciences. An order of the GKO of 11 February 1943 placed the scientific supervision of the work on the entire project on I V Kurchatov.

MSU and FIAN returned to Moscow in summer 1943. On 1 October 1943, D V Skobeltsyn was reinstated as part-time Professor and Head of the Department of Atomic Nucleus and Radioactivity of the MSU Faculty of Physics, while S N Vernov became a staff Professor of the Department. During the autumn term of 1943, D V Skobeltsyn delivered to



I V Kurchatov (left), D V Skobeltsyn (center), and L A Artsimovich.

students of the department a course on the physics of the atomic nucleus (46 lecture hours in total).

In 1944, D V Skobeltsyn, S N Vernov, and I M Frank continued their lecture courses. In November of the same year, on D V Skobeltsyn's initiative, I V Kurchatov became a Professor of the Department. The department started its planned training of students bringing them to the programs of the Atomic Project. On 21 February 1945, the GKO sent down a resolution "On training the specialists in the physics of the atomic nucleus" [3]. This resolution ordered MSU to ensure the graduation of the following number of specialists on the atomic nucleus: in December 1945 — 10, in 1946 — 25, and later — no fewer than 30 annually. The university administration was ordered to assign to D V Skobeltsyn's department 200 m² of rooms for setting up a practicum on nuclear physics. In order to increase the number of nuclear physics specialists graduating from MSU, the GKO ordered the urgent demobilization of former students from the Soviet Army and also the creation in the Faculty of Physics of a special second-year group accessible also to second- and third-year students from other institutes. Students trained in the physics of the atomic nucleus were needed most of all for working at Laboratory No. 2 (the work on the Atomic Project). Therefore, this resolution of the GKO provided sending some of the physics students of the university to Laboratory No. 2. We know that in 1943 I V Kurchatov supervised at Laboratory No. 2, for the work on the Atomic Project, the design and construction of a cyclotron with a 73-cm pole diameter (launched in 1944), and in 1945 began to design and build a new cyclotron with a 150-cm pole diameter. To carry out research on these cyclotrons, the laboratory required nuclear physicists; consequently, to train the necessary number of specialists for this cyclotron at MSU, the same resolution of the GKO included an instruction to prepare detailed plans for the construction of a cyclotron at MSU.

To organize the training and re-training of students in nuclear physics and to conduct research, D V Skobeltsyn invited new people to work in his department and in the department's laboratory. By mid-1945, the staff of the department comprised, in addition to D V Skobeltsyn, I V Kurchatov, S N Vernov, and I M Frank, also V I Veksler,

L V Groshev, S S Vasil'ev, B M Isaev, and V S Shpinel, and in the department's laboratory — N L Grigorov, L Ya Shavtvalov, S P Sokolov, L M Poperekova, and some others. To create a training practicum in nuclear physics, D V Skobeltsyn made I M Frank responsible for the selection of educational problems, and V S Shpinel (who in the pre-war years worked at the Kharkov Physical-Technical Institute) was to set up the practicum. Final-year students working on their graduation thesis were also invited to take part. The nuclear physics practicum was opened for students at the beginning of the 1945/1946 academic year.

During the autumn term of 1945, D V Skobeltsyn presented to students of the department his basic course 'Radioactive decay and nuclear reactions'. The course was mainly intended for future experimentalists (but was also obligatory for theorists). It dealt with the fundamental chapters, sufficiently completed by that time, of the physics of the atomic nucleus. Radioactive decay processes and nuclear reactions form the basis of two main techniques for studying nuclei, and the course focused maximum attention on these aspects. D V Skobeltsyn explained what kind of experiment leads to one or another of the results, and how to choose between different concepts using these experiences. The aspect of D V Skobeltsyn's lectures that was extremely strong was his critical analysis of the material presented, in which the emphasis was placed on comparing the results of theory and experiment, and on identifying the key unsolved issues.

Two students attending D V Skobeltsyn's course, I Ya Barit and M I Podgoretskii, compiled a synopsis of his lectures (edited by I M Frank) and prepared its reprinting. The synopsis of D V Skobeltsyn's lectures was the best textbook on nuclear physics during the post-war period and played a big role in training the graduating students majoring in nuclear physics in 1947–1950. On the 250th anniversary of Moscow State University, in the year of the 110th anniversary of the birth of Academician D V Skobeltsyn, the D V Skobeltsyn Institute of Nuclear Physics had a volume, *Academician D V Skobeltsyn and Moscow University*, compiled and printed; the volume included a reprint of this course of lectures [4].

The first graduation of specialists who had additional training in D V Skobeltsyn's department took place at the end of 1945. Among them were I Ya Barit, G B Zhdanov, M I Podgoretskii, I S Shapiro (future Corresponding Member of the USSR Academy of Sciences, who joined the staff of the department), and some others.

We now know that in the autumn of 1945, after the atomic bombing of Hiroshima and Nagasaki, the work on implementation of the Soviet Atomic Project was much accelerated. A GKO decree of 20 August 1945 set up a Special Committee and its Technical Council, as well as the First Main Directorate (PGU) under the USSR SNK.

A meeting of the Special Committee of the USSR SNK, which took place on 22 December 1945, discussed the draft resolution of the USSR SNK, 'On training specialists in the physics of the atomic nucleus and radiochemistry'; D V Skobeltsyn and I V Kurchatov proposed organizing at MSU a scientific and educational center for training specialists in nuclear physics and radiochemistry, in which education was to be combined with high-level research conducted at the center's modern research facilities.

On 28 January 1946, Stalin signed the decree of the USSR SNK [5]. On the basis of this document, the RSFSR People's

Commissar of Education, V P Potemkin, ordered the MSU Vice Chancellor I S Galkin on 31 January 1946 to organize since 1 February 1946 the MSU Institute of the Physics of Atomic Nucleus [referred to in unclassified documents as the Second Physics Institute of MSU (NIFI-2)]. D V Skobeltsyn was appointed its Director.

In view of all this, Skobeltsyn started working on organizing in MSU the scientific and educational center for training specialists in nuclear physics in late 1945–early 1946, in which education was to be combined with high-level research conducted at the center's modern research facilities. S N Vernov wrote: "No base for training specialists can be created without students conducting research in parallel. In nuclear physics, the scale of research is typically quite large. Achieving success in this field while keeping to a modest scale of the undertaking is highly improbable. D V Skobeltsyn understood this and the task that he formulated for himself and his collaborators demanded that the NIIYaF be set up as a large-scale research and educational institution" [6].

We need to emphasize here that not one of the higher education establishments in the country had its own modern experimental base for conducting research in nuclear physics. Consequently, the task of providing the university with the appropriate equipment as formulated by D V Skobeltsyn was very new; other universities and institutes responded to this with real steps only several years later.

After the creation of NIFI-2 [in 1957 the institute was renamed the MSU Institute of Nuclear Physics (NIIYaF MGU), and since 1993 it has borne the name of its founder D V Skobeltsyn], the Department of Atomic Nucleus and Radioactivity was transformed into the Department of the Structure of Matter. To implement the SNK resolution, it was decided to transfer to the University the building of former high school No. 154 of the Leningrad district in Moscow, near the Sokol subway station; both the Institute and the Department were located there. A very modest program of repairs and conversion of the school building to the needs of the institute started at the beginning of 1946. For some time, therefore, students continued to have classes in the university building on Mokhovaya Street.

In February 1946, an MSU order appointed two deputy directors of the institute (S N Vernov and S S Vasil'ev). D V Skobeltsyn defined the main research fields for the Institute, its structure, the plan of appointing new specialists for supervising research, teaching, and auxiliary divisions of the institute, and the list of lecture courses for students of the Department of the Structure of Matter. At the same time, he began lecturing on the course 'Radioactive decay and nuclear reactions' for students of the Department of the Structure of Matter. However, in May 1946 an order of the USSR Council of Ministers (SM) sent him to work at the UN in New York. The course of lectures was continued by I M Frank. With D V Skobeltsyn engaged in his UN duties, S N Vernov became the acting director of the institute, and I M Frank was the acting head of the department. A huge load of high-responsibility science management work fell on their shoulders and the shoulders of the heads of the structural units of the institute. New laboratories were created and started working in the new offices of the institute: cosmic rays (headed by S N Vernov), radioactive radiation (I M Frank), nuclear spectroscopy (L V Groshev), nuclear reactions (S S Vasil'ev), radiochemistry (B V Kurchatov), dosimetry (B M Isaev), nuclear practicum (L L Barysh-Tishchenko),

production workshops (A S Muratov), a scientific and technical library (A S Fain), and administrative units.

Research on cosmic ray physics was continued at the Institute under S N Vernov's guidance, in collaboration with FIAN's Laboratory of Cosmic Rays. (For more on S N Vernov's cosmic rays research and his activities as science organizer, see the materials published in *Physics–Uspekhi* in the section devoted to the Joint Session of the RAS Physical Sciences Division and the MSU Faculty of Physics commemorating the 100th anniversary of the birth of Academician S N Vernov [7–14].) The Laboratory of Nuclear Spectroscopy started designing original β -spectrometers, and the Laboratory of Nuclear Reactions was assembling the first cyclotron in the Soviet system of higher education.

Lectures for students of the department were delivered by S N Vernov, V I Veksler, M A Markov, I Ya Pomeranchuk, I M Frank, G M Frank, A M Baldin, V A Petukhov, L V Groshev, E S Kuznetsov, B M Isaev, B V Kurchatov, N P Rudenko, A A Sanin, and F L Shapiro. Work on graduation theses was supervised not only by staff members of the department and the Institute but also by many other scientists working at FIAN, the Institute of Chemical Physics of the USSR Academy of Sciences, the Institute of Theoretical and Experimental Physics, Laboratory No. 2, and many other institutes located in Moscow and its region.

The principle of involving outstanding scientists in delivering lectures and of creating an own experimental base within the institute for conducting research proved to be a more efficient practice than sending students to various research centers, because education was then following an elaborate teaching schedule based on the academic group.

Training laboratories were then created at the Institute, and special practicums were run on their bases. Practicums on nuclear physics and electronic devices started in 1946. Practicums at NIFI-2 MGU were quite adequate for experimental training in nuclear physics for students both of this specialization and of other specializations in the faculty of physics. The practicum on electron devices of nuclear physics was equipped with modern measurement and control instruments, designed by the staff of the practicum and fabricated on special order from the Fizpribor plant. Note that the NIFI-2 practicums, in fact modern training laboratories on nuclear physics, were organized for the first time in the Soviet Union.

In 1947, the USSR Government passed a decree on building new MSU buildings on Vorob'evy Hills and on providing the departments and institutes with new equipment. The NIIYaF came up with a proposal to build a higher-power cyclotron and the corresponding individual building for it. However, in view of insufficient funding, this proposal of the Institute was not included in the resulting governmental decree. In summer 1948, the situation changed, however, after D V Skobeltsyn's return from New York. Having secured the support of Academicians I V Kurchatov, S I Vavilov (President of the USSR Academy of Sciences), and A N Nesmeyanov (Vice Chancellor of MSU), D V Skobeltsyn succeeded in signing an additional order by the USSR Council of Ministers to construct a special building for accelerating installations, and another for studying extensive air showers of cosmic rays. In February 1949, a decision of the USSR Minister of Higher Education, S V Kaftanov, transformed the Department of the Structure of Matter of the MSU Faculty of Physics into the Division of the Structure of Matter (OSV). OSV students had their scholarships

increased. Since November 1949, a decision of the appropriate administration classified the Institute as one of the leading research establishments in the country. The length of annual holidays for the research staff of the Institute was increased to the maximum allowed in the USSR, and the salaries of engineers and technicians were also raised.

The USSR government highlighted the first successes in the activities of the Institute. In 1949, S N Vernov received the USSR State Prize, First Class “for experimental studies of cosmic rays in the upper atmosphere”; in 1950, N L Grigorov, A S Muratov, and Yu G Shafer were awarded the USSR State Prize “for the development and manufacturing of a precision recorder for cosmic rays”, and in 1951, D V Skobeltsyn, G T Zatsepin, and N A Dobrotin received the USSR State Prize “for the discovery and investigation of electron-nuclear showers and of the cascade process in cosmic rays”. In 1952, D I Blokhintsev won the USSR State Prize for the textbook, *Fundamentals of Quantum Mechanics*.

The year 1949 was also memorable due to another very important event. The first cyclotron in the system of higher education in the USSR was put into operation in the first quarter of this year, at the energy of 4.2 MeV in deuterons. I V Kurchatov and his colleagues greatly helped the Institute in constructing and launching this facility. With the cyclotron in operation, work started on studying nuclear reactions. A large group of students who were assigned to be employed at various atomic-power units of the country had practical training and prepared their graduation theses in the laboratory of nuclear reactions.

In September 1951, the student body of the Division of the Structure of Matter expanded significantly. As the MSU Faculty of Physical Engineering was transformed into the Moscow Institute of Physics and Technology (MFTI), MFTI students of all five years majoring in the structure of matter were transferred to the Faculty of Physics. Almost all of them were assigned to the Division of the Structure of Matter.

After half a century of functioning in the old building on Mokhovaya Street, on 1 September 1953 the Faculty started the new academic year, together with the rest of the university, in new buildings. A new separately standing building was erected for the Faculty of Physics; according to the project, nearly 20% of its internal areas, with an independent entrance on the southern side, were given to the Division of the Structure of Matter and NIFI-2.

Simultaneously, the Central Committee of the Communist Party of Soviet Union appointed, in December 1953, a commission to inspect the work of the MSU Faculty of Physics with a view to improve the training of physicists in the faculty. As a result of the work of this commission, in August 1954 a resolution of the CC CPSU appeared which emphasized the need to strengthen oversight of the faculty and to involve a number of the leading physicists of the country in teaching at the faculty.

In 1954, Vasilii Stepanovich Fursov was transferred from Laboratory No. 2 (I V Kurchatov Institute of Atomic Energy) to become the Dean of the faculty. L A Artsimovich, N N Bogoliubov, I K Kikoin, L D Landau, M A Leontovich, I E Tamm, A S Davydov, and some others who earlier took part in solving the problems encountered in creating nuclear weapons now started to teach in the MSU Faculty of Physics.

As we know, graduates of the Division of the Structure of Matter were sent to specific job placements according to a decision of the PGU, and then of the USSR Ministry of Medium Machine Building (Minsredmash). In 1946–1960,



N G Basov (left), D V Skobeltsyn (center), and A M Prokhorov.

these decisions assigned about 120 specialists to work at NIFI-2 and OSV; they formed the core of D V Skobeltsyn's scientific school. Among them were the future DSc scientists I V Rakobolskaya, L I Sarycheva, G B Khristiansen, V S Murzin, V S Nikolaev, V I Zatsepin, I P Ivanenko, Yu I Logachev, V G Neudachin, I B Teplov, A F Tulinov, E A Romanovskii, A A Sorokin, V G Shevchenko, R A Antonov, V V Balashov, Yu V Orlov, A A Petushkov, B A Khrenov, L D Blokhintsev, E V Gorchakov, V Ya Shestoperov, N G Goncharova, V V Komarov, Yu V Melikov, A M Popova, V K Grishin, B A Tverskoi, V D Pismennyi, D A Slavnov, E N Sosnovets, L A Tikhonova, Yu A Fomin, V A Eltekov, N V Kravtsov, and R A Nymnik.

D V Skobeltsyn, with his exceptionally wide erudition and scientific intuition, defined very clearly the possibility and the necessity to develop new branches of nuclear physics at the Institute. In the early 1950s, a pressing problem was the need to determine the number of nuclear constants, for which electron paramagnetic resonance (EPR) was applied. The person who headed the research in this field at the FIAN was A M Prokhorov. At NIIYaF, he worked with students of the Division of the Structure of Matter in the framework of the radioelectronics practicum. Dmitrii Vladimirovich supported A M Prokhorov's idea of organizing at the Institute a new laboratory of radio-frequency (RF) spectroscopy applied in the nuclear physics area; timewise, this moment coincided with the birth of quantum electronics. As all conditions required for progressing work on quantum electronics were already realized at the Laboratory of Radio-frequency Spectroscopy of the Institute, D V Skobeltsyn and A M Prokhorov made the decision to reorient the work of the RF spectroscopy team from solving nuclear physics problems to creating, jointly with FIAN's Laboratory of Oscillations, quantum paramagnetic amplifiers. That is how the school of quantum electronics began to grow at the Institute under A M Prokhorov's guidance.

The progress in research on controlled nuclear fusion, radio-frequency spectroscopy, and quantum electronics demanded that the Faculty of Physics start training specialists in atomic physics. Correspondingly, a Department of Atomic Physics was created in 1954 within the Division of the Structure of Matter on the initiative of L A Artsimovich, supported by D V Skobeltsyn; L A Artsimovich was appointed to head it. The new department needed its own laboratory, so a group of plasma studies was soon formed within the RF spectroscopy laboratory. The scientific supervision of the plasma group was first the responsibility of I M Podgornyi, but later passed to E P Velikhov. The Artsimovich–Velikhov school is actively growing both at the Institute and in the Division of Nuclear Physics (OYaF) of the Faculty of Physics.

On D V Skobeltsyn's initiative in the late 1950s, space physics research was started at the Institute under S N Vernov's guidance. Dmitrii Vladimirovich invited specialists of the highest qualifications working at the USSR Academy of Sciences, at industrial institutes, and at NIIYaF to give lecture courses on space physics. Researchers of the Skobeltsyn–Vernov school made decisive contributions to studies of space physics, which brought to them a number of discoveries, awards, and prizes [15].

We wish to underline again that it was at the initial phase of evolution of OYaF and NIIYaF that an entire constellation of nuclear physics experts grew up to work on the Soviet Atomic Project. These scientists matured, absorbing the lectures of D V Skobeltsyn, S N Vernov, I Ya Pomeranchuk, I M Frank, M A Markov, A M Baldin, D I Blokhintsev, F L Shapiro, I S Shapiro, L V Groshev, A S Davydov, A A Sanin, and many other eminent scientists of our country. These scientists were the graduates of the Division of Nuclear Physics (Academicians E N Avrorin, E P Velikhov, O N Krokhin, L P Feoktistov), Corresponding Members of the USSR Academy of Sciences (Yu N Babaev, V I Ritus), as well as a large group of DSc, PhD, and other researchers who received awards for their contributions to the Atomic Project.

We wish to conclude with an attempt to briefly summarize the main features of D V Skobeltsyn's scientific school. Dmitrii Vladimirovich's student Sergei Nikolaevich Vernov gave his formulation of what students should receive from their teacher: “D V Skobeltsyn delivered the introductory, basic course of lectures to students himself. He shared with them not only his profound and comprehensive knowledge but also his unique style of doing physics: theory fused to experiment. Dmitrii Vladimirovich demanded that the young people not shirk the difficulties of a theory but try their hardest to understand the most complicated theoretical papers, not to take any statements for granted, not to be a parrot to someone else because you know this someone is a respected authority on the subject. It seems to me that the huge number of specialists in nuclear physics who graduated from MSU were equipped with the method of Skobeltsyn's school. A characteristic feature of this school is to combine bold experiments with detailed analysis based on knowing the theory. Nowadays hundreds of physicists of his persuasion are armed with this valuable quality which in the early 1930s could be said about only one person in our country — Dmitrii Vladimirovich Skobeltsyn” [6].

D V Skobeltsyn was convinced that if a student or a specialist wants to become a true scientist, they ought to devote all their time to science. Talking to students at the MSU Faculty of Physics, S N Vernov gave this metaphoric

description of what science was to Dmitrii Vladimirovich and his disciples: “On Sunday, forget about a day off, and in midweek about free evenings. If you wish to grow into a true scientist, you ought to devote all your time to science—to working, thinking, reading.”

S N Vernov would often repeat that Dmitrii Vladimirovich's principle was “do well, or do not do at all.” He applied it first and foremost to science. D V Skobel'syn treated jobs aimed at organizing research activities differently from those aimed at organizing scientific events. He carefully discussed with experts the contents and impact of lectures delivered at the Department, and delved into the details of setting up experiments and creating instruments for conducting them and for processing the measurement data, and into the techniques of writing high-quality publications. To decide whether a paper prepared by researchers at NIIYaF MGU was fine-tuned enough for publication, he introduced the same procedure that proved reliable at FIAN: before sending the paper to a journal, it must be presented at a seminar (or a conference). D V Skobel'syn would then browse through the printed version and, if he felt that the article needed additional scientific or textual revision, he would send it to experts for that additional revision.

Acquiring the necessary new books and periodicals for the NIIYaF library was for Dmitrii Vladimirovich a very important issue. D V Skobel'syn had agreements with the administration of PGU (and later Minsredmash) providing for replenishment of the NIIYaF library with foreign magazines and books via the foreign currency accounts of these organizations. D V Skobel'syn placed the responsibility for compiling the lists of journals and books that needed ordering on I S Shapiro's shoulders and regularly discussed with him the inevitable problems.

Dmitrii Vladimirovich was always of the opinion that issues concerning management of the research process, as well as of the academic process in general, should be solved with maximum initiative and assertiveness in pursuing the goal; at the same time, all formal issues call for thoroughness without excessive haste. Here is a typical example. In 1957, the name of the Institute was changed from NIFI-2 to NIIYaF. In view of this, a draft of new statutes of the Institute was prepared by S N Vernov and one of the authors of this article (E A Romanovskii) on the initiative of the communist party bureau of the Institute (S N Vernov was one of its members); the draft received the approval of the legal department of MSU. However, Dmitrii Vladimirovich refused to read this draft when S N Vernov submitted it to him. His question was: does the absence of an updated statute constitute an obstacle to conducting research at NIIYaF? Vernov's reply was: “No, it does not”. “Neither is it an obstacle to me,” said Skobel'syn. “We shall rewrite the statutes when the university decides the need has arisen to change them.” The statutes of the NIIYaF MGU were indeed rewritten, but only after MSU gained legal autonomy (1990).

Dmitrii Vladimirovich's position vis-à-vis his colleagues at the Institute was that of wisdom and kindness. If there was an intense debate, he would find a just solution that everyone would accept. A squabble was something he could not tolerate and would not allow in his Institute. He would say: “Where a squabble starts, science dies.” Dmitrii Vladimirovich would resolve any issue in the Institute and in the Division of Nuclear Physics from the standpoint of the interests of the job at hand, in the spirit of his highest responsibility as a citizen.

G B Khristiansen wrote that anyone who had the luck of being D V Skobel'syn's pupil or working under his guidance remembers “this sensation of reliability, strength, wisdom, and kindness that one would invariably feel dealing with him, the feeling that is so often lacking in this current way of life, which always showers us with surprises” [16].

References

1. Vavilov S I, Levshin V L “Zapiska FIAN SSSR v Prezidium AN ‘Ob organizatsii rabot po issledovaniyu atomnogo yadra pri Akademii nauk SSSR’” (“Memorandum of LPI USSR to the Presidium of the Academy of Sciences ‘On managing of the research project of physics of atomic nucleus in the USSR Academy of Sciences’”), in *Atomnyi Proekt SSSR. Dokumenty i Materialy* (USSR Atomic Project. Documents and Materials) Vol. 1 1938–1945 Pt. 1 (Gen. Eds L D Ryabev, compiled by L I Kudinova) (Moscow: Fizmatlit, 1998) p. 36
2. *Zapiski Arkhivariusa* (Notes of an Archivist) Vol. 1, Iss. 1 (Moscow: FIAN, 1992) p. 29
3. “Postanovlenie GKO No. 7572ss/ov of 21.2.1945 g. ‘O podgotovke spetsialistov po fizike atomnogo yadra’” (“Resolution of the GKO No 7572 ss/ov of 21.2.1945 ‘On training specialists in the physics of atomic nucleus’”), in *Atomnyi Proekt SSSR. Dokumenty i Materialy* (Atomic Project USSR. Documents and Materials) Vol. 1 1938–1945 Pt. 2 (Gen. Eds L D Ryabev, exec. compiled by L I Kudinova) (Moscow: Izd. MFTI, 2002) p. 223
4. Barit I Ya, Podgoretskii M I (Compilers) “Radioaktivnyi raspad i yadernye reaktsii. Konspekt lektsii, chitannykh akademikom Skobel'synym D.V. v 1945–1946 gg.” (“Radioactive decay and nuclear reactions. Synopsis of lectures delivered by Academician Skobel'syn D V in 1945–1946”), in *Akademik D.V. Skobel'syn i Moskovskii Universitet* (Academician D V Skobel'syn and Moscow University) (Eds B S Ishkhanov, M I Panasyuk, E A Romanovskii) (Moscow: UNTs DO, 2002) p. 27
5. Stalin I, Chadaev Ya “Postanovlenie SNK SSSR No. 225-96ss of 28.1.1946 g. ‘O podgotovke inzhenerov-fizikov i spetsialistov po fizike atomnogo yadra i po radiokhimii’” (“Resolution of the USSR SNK No. 225-96ss of 28.1.1946 ‘On training the engineers–physicists and specialists in the physics of atomic nucleus and radiochemistry’”), in *Atomnyi Proekt SSSR. Dokumenty i Materialy* (USSR Atomic Project. Documents and Materials) Vol. 2 *Atomnaya Bomba. 1945–1954* (Atomic Bomb. 1945–1954) Book 2 (Gen. Ed. L D Ryabev, exec. compiled by G A Goncharov) (Sarov: Izd. RFYaTs–VNIIEF, 2000) p. 102
6. Vernov S N “D.V. Skobel'syn kak rukovoditel' shkoly fizikov i osnovatel' NIIYaF MGU” (“D V Skobel'syn as a leader of the school of physics and the founder of INP MSU”), in *Vospominaniya ob Akademikakh D.V. Skobel'syne i S.N. Vernove* (Memoirs about Academicians D V Skobel'syn and S N Vernov) (Eds M I Panasyuk, E A Romanovskii) (Moscow: Izd. MGU, 1995) p. 42
7. Ryazhskaya O G *Phys. Usp.* **54** 181 (2011) [*Usp. Fiz. Nauk* **181** 187 (2011)]
8. Matveev V A *Phys. Usp.* **54** 182 (2011) [*Usp. Fiz. Nauk* **181** 188 (2011)]
9. Sadovnichy V A *Phys. Usp.* **54** 185 (2011) [*Usp. Fiz. Nauk* **181** 191 (2011)]
10. Trukhin V I *Phys. Usp.* **54** 189 (2011) [*Usp. Fiz. Nauk* **181** 195 (2011)]
11. Panasyuk M I *Phys. Usp.* **54** 190 (2011) [*Usp. Fiz. Nauk* **181** 197 (2011)]
12. Dergachev V A *Phys. Usp.* **54** 202 (2011) [*Usp. Fiz. Nauk* **181** 210 (2011)]
13. Stozhkov Yu I, Bazilevskaya G A *Phys. Usp.* **54** 210 (2011) [*Usp. Fiz. Nauk* **181** 218 (2011)]
14. Berezhko E G, Krymsky G F *Phys. Usp.* **54** 215 (2011) [*Usp. Fiz. Nauk* **181** 223 (2011)]
15. Sadovnichy V A, Il'chenko V I (Gen. Eds) *Akademik Sergei Nikolaevich Vernov. K 100-letiyu so Dnya Rozhdeniya* (Academician Sergei Nikolaevich Vernov. On 100th Anniversary of His Birth) (Moscow: Izd. MGU, 2010)
16. Khristiansen G B “Ecce Homo”, in *Vospominaniya ob Akademikakh D.V. Skobel'syne i S.N. Vernove* (Memoirs about Academicians D V Skobel'syn and S N Vernov) (Eds M I Panasyuk, E A Romanovskii) (Moscow: Izd. MGU, 1995) p. 55