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**TO THE 110-th ANNIVERSARY  
OF THE ACADEMICIAN OF THE NAS OF UKRAINE  
B.G. LAZAREV'S BIRTHDAY**

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“Doesn't our Motherland ask for help in the eloquence, when so many of her famous disciples had gone away completely forgotten?” Those words of Theophan Prokopovych (a devotee in the domain of education in the 18-th century) remain quite actual till now, because, unfortunately, the *curriculum vitae*<sup>1</sup> of our compatriots, the founders of the world-famous scientific schools in Ukraine, become dispersed in time.

**They did live!**<sup>2</sup>

*“In the late 1950s and the early 1960s, the Kharkiv Physical and Technical Institute was one of the leading world centers in metal physics. This fact was connected with the works performed at the department headed by B.G. Lazarev.”*

Academician of the NAS of Ukraine  
V.G. BAR'YAKHTAR

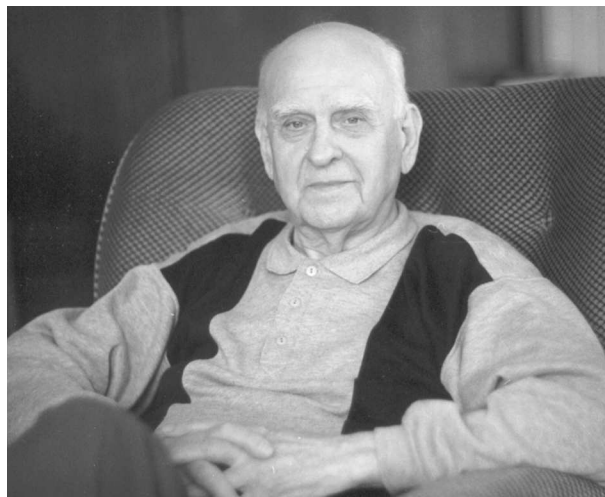
Boris Georgievich Lazarev was the tenth of eleven children in the parish priest's family. He was born on August 6, 1906, in the village of Myropillya (now the Sumy region). Boy's parents were respectable and virtuous people. They hoped that their children would also obtain a good education.

In 1916, after a two-year study at the parish school of his father, Boris Lazarev was enrolled in the Belgorod classical school. However, hard times of social calamities – the revolutionary events in 1917 and the destruction of social foundations – forced him to

abandon studying for some time and, in order to survive, to look for earning opportunities.

He worked as a beekeeper assistant (in 1920), an errand boy at a metallurgical plant (in 1921–1922), a laboratory apprentice (in 1923), a clerk, and a bookkeeper (in 1924–1926). However, the first rigorous life tests did not cancel his desire to study. Boris finished a seven-year school at Yuzivka (in 1920–1923) and, later, a vestibule school (in 1924–1926).

“About the classical and vestibule schools, Boris Georgievich mentioned very positively. This concerned both the pedagogical staff and the teaching methods and programs. ... By the way, at the vestibule school's library, Boris Georgievich came to know for the first time what the ultra-low temperatures are. ... At that time, he was fond of astronomy (he had a good telescope) and botany (herbaria, a plant identification guide). It is worth mentioning



**Photo 1.** Boris Georgievich Lazarev

<sup>1</sup> *Curriculum vitae* is a Latin expression meaning the course of life.

<sup>2</sup> According to Plutarch, “so said the Romans about those who are dead, in order to avoid the pronunciation of inauspicious words”. Plutarch, *Parallel lives* (Dnipro, Kyiv, 1991) (in Ukrainian).

that, even after decades, Boris Georgievich astonished by his knowledge of the stellar sky and awareness of botany" [1, p. 843].

In 1926, Boris Lazarev entered the Faculty of Physics and Mechanics at the Leningrad Polytechnic Institute. Even when a student, he began to work at the Leningrad Physical and Technical Institute. In particular, he dealt with research facilities to study submillimeter waves.

After graduating from the institute in 1930, Boris Georgievich Lazarev was invited to a permanent job at the Leningrad Physical and Technical Institute. When working at the magnetic laboratory headed by Ya.G. Dorfman, he became interested in a new branch of science, low-temperature physics. Already in the early 1930s, his first scientific works dealing with the development of the superconductivity criterion were published.

In 1932, Boris Georgievich had to move to Sverdlovsk. There, he participated in the development of the Ural Physico-Technical Institute (UralPTI). In particular, he organized a cryogenic laboratory.

In 1934, he was missioned to the Ukrainian Physico-Technical Institute (UPTI, Kharkiv) to gain experience in researches concerning the ultra-low temperature physics and technique. It was done, because the laboratory headed by Lev Vasylyovych Shubnikov was the first and the only cryogenic laboratory in the USSR till 1935.

During that period, in particular, in the cooperation with L.V. Shubnikov, the nuclear magnetization and the nuclear moment of a proton were measured for the first time. The substance magnetization time was very short: it was about 13 orders of magnitude smaller than the corresponding theoretically predicted value. Therefore, according to the apt comment given by the scientific community, those works became a "triumph of experiment".

"In 1935, with the participation of Boris Georgievich, tanks for holding liquid methane were created; and, for the first time in the world, methane was used as a motor fuel, and liquid oxygen for welding and cutting metals, as well as for the life support of aircrews. ... Liquid oxygen was used by the crews of Gromov, Danilin, Yumashev (1937), Grizodubova and Raskova. During the war, those systems provided high-altitude flights of our bombers to Berlin" [1, p. 844].



Photo 2. B.G. Lazarev and I.M. Dmitrenko

Here is another relevant fact. At the contest of young scientists of the Academy of Sciences of the UkrSSR, Boris Georgievich and Lyubov Samoilovna Kan-Lazareva won a prize for a simple method of obtaining and using ultra-high pressures at low temperatures. Later, the method was widely applied and called the "ice bomb".

In 1936, B.G. Lazarev became the head of the cryogenic laboratory at the Ural Physico-Technical Institute, and in 1938, he was appointed the head of the low-temperature laboratory at the Ukrainian Physico-Technical Institute.

From the notes of Boris Georgievich: "In 1937–1941, the UPTI together with the cryogenic laboratory (as well as with the whole country) passed through tragic events. Owing to the lawlessness of that epoch, a group of my collaborators were repressed: the Director of the UPTI, Academician of the AS of the UkrSSR Oleksandr Illich Leipunskyi; the founder of the institute, Corresponding Member of the AS of the USSR Ivan Vasylyovych Obreimov, and the head of cryogenic laboratory Lev Vasylyovych Shubnikov. Oleksandr Illich and Ivan Vasylyovych returned back from the "better world", whereas Lev Vasylyovych remained there...

In August, 1937, I was summoned to the Narkomvazhprom (the UralPTI and KhPTI were within its



**Photo 3.** Guests of A.F. Prikhotko. From left to right: N.S. Kurdyumova, G.V. Kurdyumov, A.I. Leipunskyi, B.G. Lazarev, V.G. Khotkevych, A.F. Prikhotko

jurisdiction); and the chief of the science sector A. Armand told me that I was appointed to Kharkiv. At that time, I was a very shy man. However, in this case, I resisted desperately, but in vain. In effect, I was unceremoniously transferred by order from the UralPTI to the KhPTI.

Of course, behind the unceremonious character of the process, a concern about the fate of the cryogenic laboratory at the UPTI was hidden. To my remark 'But you know that I am organizing a cryogenic laboratory in Sverdlovsk', I heard the answer: 'While you are starting in Sverdlovsk, the created in Kharkov can collapse...'

In 1938, I was appointed the head of the cryogenic laboratory at the UPTI. The organization of cryogenic laboratory at the UralPTI (it was nevertheless completed with the assistance of the UPTI) was delayed till 1957" [2, p. 8].

The year of 1941 ... The UPTI was evacuated to Kazakhstan ... A group of collaborators headed by B.G. Lazarev worked at the Balkhash copper smeltery. They dealt with the problem of reducing the loss of copper at its fabrication. In 1944, those researches were distinguished by the Diploma of the Supreme Council of Kazakhstan "For the solution of scientific and engineering problems associated with the economic and military applications".

In 1943, B.G. Lazarev defended his thesis "Some researches of superconductivity" for the degree of Doctor of Science in physics and mathematics.

In April 1944, the institute was evacuated back to Kharkiv. Boris Georgievich was certain that "a too

fast recovery of the institute (together with the cryogenic laboratory) was associated with the fact that the UPTI was ... extremely burdened with a large Kurchatov's program on the uranium problem... The work in the framework of I.V. Kurchatov's program with its obligatory character and high intensity favored, to a large extent, a too rapid recovery of institute's "form", the expansion of its equipment base, and the diversity of cryogenic facilities; it became an excellent springboard for the future success" [2, p. 17]. It was no chance that Boris Georgievich Lazarev was elected Corresponding Member of the AS of the UkrSSR at an age of 42, and Academician at 45.

His disciple, Academician of the NAS of Ukraine Igor Mykhailovych Dmytrenko recalled, "A large role in the scientific life of the department belonged to the seminar. The seminar was a sacred deal: every researcher had to actively participate in the seminars, which were regularly held in the office of Boris Georgievich or in the hall of administrative building.

The seminars chaired by B.G. Lazarev were a true scientific school. He remembered almost all previous publications on low temperature physics, included them into the discussion of the reports, and monitored that the authors should observe the citation ethics with respect to their predecessors.

Almost all seminars were participated by I.M. Lifshitz ("Ilmekh"), M.I. Kaganov ("Musik"), A.F. Prikhotko, and many other physicists. The seminar was often attended by L.D. Landau ("Dau"). Petr Leonidovich Kapitsa, whom B.G. highly respected and, in turn, enjoyed the high authority over Petr Leonidovich and his respect<sup>3</sup>, also participated. Boris Georgievich was a moving spirit and a master of seminars. He demanded that the speakers should clearly and accurately explain the physical basis before proceeding to writing formulas and equations. His comments and criticism were carefully considered by both experimentalists and theorists. A

<sup>3</sup> As an illustrative example, here is a postcard dated 1974: "Dear Boris Georgievich, Thanks a lot for your congratulations. I was particularly pleased to receive them from you, because our institutions and students were strongly linked with one another by their work, and I have family feels toward Kharkiv and Kharkiv institutions. My congratulations and best wishes to you. Sincerely yours, P.L. Kapitsa" [3, p. 425].

young speaker-loser, who came to grief at the seminar, was encouraged by B.G. when they came across each other..." [1, p. 846].

The scientific secretary of the institute Volodymyr Solomonovych Kogan presents other, no less conspicuous facts: "Boris Georgievich not only trained a pleiad of talented scientists. With his help, a network of new cryogenic laboratories equipped with liquefaction machines developed at the cryogenic laboratory, headed by him, of the UPTI was created in our country and abroad.

He put a lot of efforts to organize cryogenic laboratories in Leningrad, Sverdlovsk, Kyiv, Sukhumi, and Makhachkala, to say nothing of a new laboratory at the Kharkiv University (it was headed by his friend, the future rector of the Kharkiv State University Volodymyr Gnatovych Khotkevych) and at the Institute of Radio Electronics of the AS of the UkrSSR.

The cryogenic laboratory of the UPTI is a place, where scientists from Poland, Czechoslovakia, Hungary, and China were trained. Later, with the help of this laboratory, they created new cryogenic laboratories in their countries".

Years passed... However, as Academician of the NAS of Ukraine Yurii Matsevytyi tells, despite all that, "Boris Georgievich was physically strong till

the last years of his life; he kept trim and had a youthful appearance. For everybody, he wore well, as if he did not grow old, and belonged to that rare category of people, who are not associated with the words "old age", "advanced age", and so forth. To a great extent, it was a result of his character, purposefulness, favorite work, enthusiasm, going in for climbing, contacts with interesting and congenial people, and, certainly, the atmosphere in his family: his daughter Marina, a PhD, a metal physicist, and a climber as well; his granddaughters; his son-in-law Boris Petrovich, Doctor of Science in biology, cryobiologist, and also an outstanding person; and, surely, Lyubov Samoiloyna, a faithful companion, colleague, and his roped partner when climbing the mountain".

The full member of the National Academy of Sciences of Ukraine Boris Georgievich Lazarev left the vale of life on January 20, 2001.

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2. B.G. Lazarev, To the history of cryogenic laboratory at the UPTI-NSC "KhPTI", *Fiz. Nizk. Temp.* **26** (Suppl.) (2000).
3. A.V. Tan'shyna, *Founders of Kharkiv Scientific Schools in Physics* (Akademperiodyka, Kyiv, 2005) (in Ukrainian).

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