

The jubilee of B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine

It was fifty years ago, on 13 May 1960, that the Institute for Low Temperature Physics and Engineering was founded in Kharkov. The foundation of the Institute was the result of intense preparatory work of a group of physicists led by B.I. Verkin who at that time worked at the Ukrainian Institute of Physics and Technology (UIPT). The group also included A.A. Galkin, I.M. Dmitrenko, B.N. Esel'son, and V.I. Startsev. Strong support to the creation of the Institute was given by P.L. Kapitza, the head of the Scientific Council «Low Temperature Physics» of the Academy of Sciences of the USSR. The decision to create the Institute in Kharkov was quite natural. It was here, in UIPT, that the first Soviet cryogenic laboratory was organized in 1931 by the eminent physicist Lev Shubnikov. The works of L.V. Shubnikov, B.G. Lazarev and their colleagues laid the foundations of the Kharkov school of low temperature physics. Its scientific traditions were confirmed and developed in the Institute, whose director for many years was its founder Boris Verkin.

Just after the foundation of the Institute nine laboratories were organized to carry out research in main branches of low temperature physics. There was also the Special Design and Technology Bureau and Pilot Production Plants concentrated on applications. It should be specially noted that four mathematical departments were organized and headed by well-known mathematicians including A.V. Pogorelov and V.A. Marchenko. In 1987, a Mathematical Division was organized in the Institute.

The creative collaboration between physicists, mathematicians, and engineers working to solve the topical problems of low temperature physics and mathematics, implementation of the obtained results in prototypes of newest cryogenic equipment — all this served as a strong impetus to development of the newly established Institute, in which the mean age of the employees was 26 years in the early 1960's. World level experimental and theoretical results obtained in the studies of superconductivity, normal metals, magnetism, cryocrystals, liquid and solid helium, biophysics, low temperature materials, as well as in fundamental and applied mathematics brought the Institute wide recognition in the scientific community as early as the 1960's and 1970's. Large-scale scientific and techno-

logical research was carried out in the field of space materials and cryogenic instrument engineering, various equipment for obtaining low and ultralow temperatures was developed and put to work.

In the 1980's, the Institute was continuously progressing in the research broadening the range of its scientific interests to include high- T_c superconductivity, experiments on physical properties of helium at temperatures as low as several millikelvins, carbon nanomaterials, mesoscopic systems, and the current problems of mathematics. Considerable success was achieved in developing superconductive electronic devices with unprecedented levels of sensitivity and stability.

The years were going by, new interesting problems were arising, new areas of scientific research were emerging, new generations of physicists and mathematicians came, but the ambitions of our researchers to obtain top level results in fundamental low temperature physics and mathematics were the same as ever.

In 1991, the Institute was given the name of its founding director Academician B.I. Verkin.

The team of B. Verkin Institute for Low Temperature Physics and Engineering of the NAS of Ukraine is proud of its achievements that have won the world's recognition, among which the detection of microwave radiation of Josephson junctions, the discovery of quantum tunnel mass transfer in helium, the discovery and development of the point-contact spectroscopy, the solution of the 4th Hilbert problem, the elaboration of the method of inverse scattering problem, and the development of quantum group theory. During the 50 years, nearly 250 monographs, textbooks, tutorials, and reference books have been published, over 12 000 papers and reviews have appeared in prestigious scientific journals, more than 850 high level experts — candidates and doctors of science — have been trained. Scientific results of the Institute's researchers have won three Lenin Prizes, two State Prizes of the USSR, twenty-three State Prizes of Ukraine, a number of prizes of the NAS of Ukraine named after outstanding scientists, as well as some prestigious international prizes, including the Fields Medal, the Hewlett Packard Prize of the European Physical Society, and the Lise Meitner Prize awarded by the «Fysikcentrum» of Gothenburg.

There are now over 80 doctors of science and 150 candidates of science (PhD doctors) at the Institute. Three specialized councils for the defense of doctor's and candidate's theses in nine specialties in physics and mathematics give scientific degrees to young researchers, including those from the Institute's graduate school.

For more than 30 years, the Institute has been publishing the journal «Low Temperature Physics» that now has the highest impact factor among the nearly 1000 scientific journals of Ukraine. We also publish the «Journal of Mathematical Physics, Analysis, Geometry».

The Institute is an integral part of the National Academy of Sciences of Ukraine. It employs the Academicians (Full Members) of the NAS of Ukraine V.V. Eremenko, N.F. Kharchenko, E.Ya. Khruslov, V.G. Manzhelii, V.A. Marchenko (also Academician of the Russian Academy of Sciences), L.A. Pastur, I.K. Yanson, and the Corresponding Members of the NAS of Ukraine S.L. Gnatchenko, A.N. Omelyanchouk, E.Ya. Rudavskii, and M.A. Strzheimchny who successfully continue the traditions of the Kharkov scientific schools.

The remarkable scientists: Academicians of the NAS of Ukraine A.V. Pogorelov and I.M. Dmitrenko, Corresponding Members of the NAS of Ukraine A.M. Kosevich and A.I. Zvyagin were at the Institute for many years. While working at the Institute, V.G. Drinfeld, I.V. Ostrovskii, I.O. Kulik, and A.A. Galkin were awarded Corresponding Membership in our Academy. Later, A.A. Galkin was elected an Academician after he had moved to Donetsk where he created and was chosen to head the Institute of Physics and Engineering now bearing his name. Several researchers that at one time worked at the Institute were subsequently elected members of the Academy: Academician of the NAS of Ukraine V.P. Semynozhenko, Corresponding Members of the NAS of Ukraine I.V. Matyash, L.F. Sukhodub, and L.T. Tsymbal.

The world known Institute, creation of B. Verkin and his colleagues, is a unique team of physicists and mathematicians that not only managed to meet the challenges of global changes, but is also continuing successfully its advances in modern science and reinforcing itself with talented young researchers.

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