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AN ANTOLOGY OF THE DISTINGUISHED ACHIEVEMENTS IN SCIENCE AND TECHNIQUE. PART 31: PORTRAIT OF THE KHARKIV PHYSICIST ALEXANDER ILYICH AKHIEZER

Purpose. Description in the short form of the basic distinguished scientific achievements, features of personality and way of life of the known Kharkiv theoretical physicist A.I. Akhiezer. Methodology. Existent scientific approaches for treatment and systematization of physical knowledges. Methods of historical method at research of development in human society of basic sections of theoretical physics. Results. Short information is resulted about the basic creative and vital stages, and also fundamental scientific achievements of the indicated prominent physicist of the 20th century. Some personal qualities of this Kharkiv theoretical physicist, becoming a founder known in the world of physical school are described. Originality. First the Kharkiv scientist-electrophysicist for the wide circle of readers imagined a short scientifically-historical essay the known physicist of contemporaneity, being based on his scientific works and published materials about him. Practical value. Scientific popularization of creative activity of the known Kharkov physicist and his achievements in area of theoretical physics. Next reminder a wide reader on the example of creative life in science and got prominent scientific results of works of one human personality known in the scientific world about incessant in modern society connection of times and generations. References 33, figures 10.
Key words: **history, physics, Kharkiv region, distinguished scientific achievements.**

Приведен краткий научно-исторический очерк об известном физике-теоретике Харьковщины − академике АН УССР (НАН Украины) Ахиезере А.И. и его выдающемся вкладе в мировую физическую науку. Библ. 33, рис. 10.
Ключевые слова: **история, физика, Харьковщина, выдающиеся научные достижения.**

Introduction. In [1] the author has described portraits of eminent physicists of the «high-brigade» of the Ukrainian Physico-Technical Institute (UPTI) – A.K. Walter, K.D. Sinelnikov, A.I. Leypunsky and G.D. Latyshev, which largely can be called experimental physicists, rather than theoretical physicists. Of course, such a highly conditional approach to the division of experimental physicists, theorists and commentators not diminish the role of the aforementioned legendary Kharkiv scientists in the development of many theoretical problems in the field of nuclear physics, accelerator technology, high-energy physics and plasma technology. To achieve at the UPTI world-class scientific results from the beginning of the organization in our country, this new generation of this Physics Institute (1928) in its structure for the first time in the Soviet Union was specifically highlighted the theoretical division or structurally organized during the craze in the 1930s the so-called «theoretical brigade». The credit for the structural formation of such a purely theoretical division in UPTI belongs to its first director, the future Academician of the Academy of Sciences of the USSR (1958), Ivan Vasilyevich Obreimov (1894-1981). Thefirst head of the theoretical division of the UPTI in the period 1928-1931 was the famous Soviet physicist Dmitri Dmitrievich Ivanenko (1904-1994), the world's first proposed in 1932 by the proton-neutron model of the nucleus of an atom of matter [2, 3]. In the period 1932-1937 theoretical department of the UPTI was headed by talented Soviet physicist and future Nobel Prize winner in Physics (for 1962) Lev Davidovich Landau (1908-1968) [2, 4, 5]. After moving L.D. Landau to Moscow (1937), where he became head of the Theoretical Department of the Institute of Physical Problems (IFP) of the USSR Academy of Sciences (director of the IPP - the world-famous scientist, Academician of the Academy of Sciences of the USSR and the future winner of the Nobel Prize in Physics (1978) Petr Leonidovich Kapitsa (1894-1984) [4]), the theoretical department of the UPTI since 1938 was headed by his pupil, Ph.D. and the future Academician of the Ukrainian SSR Academy of Sciences Alexander Ilyich Akhiezer [2]. Note that at the UPTI in 1941 and the second theoretical department was created, headed by a Prof. and future Academician of the USSR Academy of Sciences Ilya Mihailovich Lifshitz (1917-1982) [2]. Employees of these theoretical divisions «shoulder to shoulder» in close scientific and industrial contacts with employees of all other departments UPTI effectively solved defined by on their decision-making bodies of the Soviet country complex scientific and technical problems in domains of priority areas of nuclear and experimental physics having mostly special (secret) character. «Pure» science staff of the UPTI theoretical departments were engaged only after the decision of the immediate tasks for the scientific support of the Institute carried out design development and manufacturing on their basis in the «metal» planned legislative solutions products. Using the form of a brief historical sketch of scientific and, to the best of their knowledge and physical abilities epistolary try to «draw» a multi-faceted portrait of the outstanding domestic theoretical physicist A.I. Akhiezer (Fig. 1) which became one of the brightest legends of Kharkiv.

Fig. 1. Outstanding Soviet and Ukrainian physicist, Doctor of Physical and Mathematical Sciences, Prof., Academician of the Ukrainian Academy of Sciences (NASU), Honored Scientist of Ukraine, laureate of State Prize of Ukraine in the field of science and technology Alexander Ilyich Akhiezer (1911-2000) [7]

The main stages of the life and career of the Kharkiv physicist. Born Akhiezer A.I. on October 31, 1911 in the city of Cherikov, Mogilev province (now Belarus), then part of the co-becoming of the Russian Empire, the son of a country doctor Ilya Alexandrovich and Natalia Grigirievna Akhiesers [6]. In 1934 he graduated from the energy department of the Kiev Polytechnic Institute, and after examination of interview on the knowledge of physics and mathematics at the captious L.D. Landau began working at the Theoretical Department of the UPTI. In 1936, A.I. Akhiezer (Fig. 2) successfully defended his PhD thesis on the study of the scattering of photons on photons at high frequencies (low frequencies for the physical event on the scattering «of light in the world» was considered much earlier prominent German physicists Leonard Euler (1707-1783) and Werner Heisenberg (1901-1976) [8]), and became Candidate of Physical and Mathematical Sciences. This scientific task in front of him was placed by his supervisor, the head of the Theoretical Division of the UPTI, Prof. L.D. Landau. By the way, A.I. Akhiezer was the third physicist, who passed to L.D. Landau «Theoretical minimum» (two examinations at special mathematics and seven examinations in the main sections of theoretical physics [4, 5]). The first physicist who passed to L.D. Landau «Theoretical minimum» was Kompaneets Alexander Solomonovich (1914-1974), and the second one - Eugene Mikhailovich Lifshitz (1915-1985) which in the future became famous Soviet theoretical physicists [6, 9]. Next, the reader's attention should be paid to worked in the 1930s at the same with A.I. Akhiezer Theoretical Department of the UPTI (period 1935-1937) Hungarian Laszlo Tisza (see Fig. 2), graduated in 1928 from the Göttingen University voluntarily come to work in one of the best in Europe at the physical science centers - UPTI and became in 1960 a professor of physics at the Massachusetts Institute of Technology (USA). Namely American survivor, Prof. L. Tisza turned to the history of development in science and technology UPTI the last of the witnesses of the turbulent time for UPTI 1930s and acting in it scientific, historical persons [7, 10].

Fig. 2. Candidate of Physical and Mathematical Sciences A.I. Akhiezer (left) and in the future the famous American physicist Laszlo Tisza (1907-2009) - employees of the theoretical department of the UPTI led by talented theoretical physicist Doctor of Physical and Mathematical Sciences, Prof. Landau (Laboratory building of the UPTI at the old institute site on the Tchaikovsky Street, 1936, Kharkiv) [7, 10]

At the end of the 1930s at the center of scientific interest of Akhiezer A.I. is the interaction of ultrasound with crystals. In 1938 he obtained a kinetic equation for a gas of quasiparticles in crystals. He developed the kinetic energy theory of sound absorption in dielectrics and metals. Designed they sound energy absorption mechanism in the crystals obtained in physics called «*Akhiezer absorption mechanism*» [6, 8, 11]. In 1940, A.I. Akhiezer on this subject successfully defended his doctoral thesis, and in 1941 became a Professor at Kharkiv State University (KSU) named after V.N. Karazin [11]. In the period 1936-1990 he taught at the Kharkiv State University named after V.N. Karazin, and in the period 1951-1964 – at the Military Radio Engineering Academy [11] In 1940 he founded the Department of Theoretical Nuclear Physics at the Physics and Mathematics Faculty of KSU named after V.N. Karazin and headed it until 1975. In the period of the military evacuation of the UPTI (1941-1943) to Alma-Ata (Kazakhstan) in parallel with the main work as the head of the Theoretical Division of the UPTI-FTI (the period 1938-1988) he was a part-time teacher at the Kazakh Mining Institute [11]. In the period 1944-1952 he was at the invitation of Academician Igor Vasilievich Kurchatov as a seconded by UPTI-PTI worked in Moscow in a special laboratory №2 (now RRC «Kurchatov Institute») to solve physical problems in the framework of the Atomic Project of the USSR [12]. As we can see, he, unlike his older brother, mathematician Naum Ilyich Akhiezer (1901-1980) [13], did not refused from the incoming suggestions from his scientific leader of this grand-scale problems to be solved and the investment of scientific and technological project, the outstanding Soviet scientist and organizer of science I.V. Kurchatov. In view of the come declassification in Russia and

Ukraine many works of the period 1940-1950s. by this secret superproject [3] and the appearance in the press and on the Internet a lot of information about them, now we can say that one of the important tasks of problem that can be solved in the «Moscow period» of work of Akhiezer A.I. (Fig. 3), was the problem of the scattering of «slow» neutrons in crystals [14]. This task Akhiezer A.I. has solved together with the talented Soviet theoretical physicist and future academician of the Academy of Sciences of the USSR Isaak Jakovlevich Pomeranchuk (1913-1966), also worked in the 1930s at the Theoretical Department of the UPTI under the leadership of the legendary Soviet theoretical physicist L.D. Landau [4]. The importance of the physical problem, successfully solved by Akhiezer A.I. and Pomeranchuk I.Ja., may indicate that it was impossible without the solution to develop and create a right to the USSR as a well-functioning nuclear reactor to produce plutonium-239 (nuclear explosives №1), and the use of uranium-235 nuclear technology (nuclear explosives №2) for the first Soviet atomic bomb [3, 14]. In addition, they (A.I. Akhiezer, I.Ja. Pomeranchuk) regardless of the outstanding Italian theoretical physicist, Nobel Prize winner in Physics (for 1938) Enrico Fermi [4] established the possibility of using certain crystalline materials (e.g., ultrapure graphite [4, 8]) «cold» neutrons, developed the theory of neutron refraction (the term «*refraction*» comes from the Latin word «*refractus*» – «*refracted*» [15]) and the neutron absorption theory in homogeneous solid media [14]. Some of the results of these studies included in their joint scientific monograph «*Some problems of the theory of the nucleus*» (1948) awarded in 1949 of the prize named after L.I. Mandelshtam of the USSR Academy of Sciences [14].

Fig. 3. Doctor of Physical and Mathematical Sciences, Prof. A.I. Akhiezer at his office of the Head of Department of Theoretical Physics of the UPTI (in the short days of arrival from Moscow to «furlough» with family and the staff of the Institute), resumed his permanent work after the difficult years of war and military evacuation in Alma-Ata (1946, UPTI-PTI, Kharkiv) [7]

Combining up to 1952 work at the UPTI-PTI (in its theoretical department and organized in 1945 on the initiative of the supervisor of the Atomic Project of the USSR, Academician of the USSR Academy of Sciences I.V. Kurchatov, under the supervision of the director of the institute, Doctor of Physical and Mathematical Sciences, Prof. Kirill Dmitrievich Sinelnikov [1] special Laboratory №1, existed in UPTI-PTI to 1950) and the Moscow special laboratory №2, led by the legendary I.V. Kurchatov and dedicated exclusively to the problems of the Soviet Atomic Project, A.I. Akhiezer extends the «field» of his scientific activity. It was to include quantum electrodynamics and elementary particle physics, nuclear physics and the theory of linear accelerators, solid state physics and magnetism, plasma physics, magnetic hydrodynamics and the theory of the interaction of charged particles with crystals [14]. Using materials of current Internet communications [6, 9-12, 16] and a number of scientific papers by Akhiezer A.I. [17-27] indicate some of them received personally and together with his favorite pupil (Fig. 4) the fundamental results in the specified areas of physics for many years during their theoretical studies.

Main scientific achievements of the Kharkiv Physics. Scientifically known in the USSR and abroad to Doctor of Physical and Mathematical Sciences, Prof., Academician of the Ukrainian Academy of Sciences A.I. Akhiezer brought his theoretical developments in the fields of physics mentioned above. Formulate in a compressed form based on published material [6, 9-12, 16-27] basic scientific achievements he received during the 1930-1990s in the field of modern physics:

- The problems of the scattering of high-energy photons on photons (quantum-physical scattering of «light on light» for the high frequencies) and coherent scattering of photons on atomic nuclei are strictly solved (co-jointly with I.Ja. Pomeranchuk, 1936-1938);
- He developed basics of a new kinetic theory of sound absorption in solids («*Akhiezer absorption mechanism*», 1938);
- The processes of dispersion and absorption of the «slow» neutrons crystal substances are investigated (co-jointly with I.Ja. Pomeranchuk, 1944-1947);
- He predicted (regardless of the unknown to him then results by E. Fermi) the possibility of obtaining stable nuclear experiments in nuclear reactors and «cold» neutrons (1944-1947);
- He introduced a new concept of magnons (spin-wave quanta) in ferrodielectrics and considered their interaction with phonons and with each other (1946);
- He predicted by calculations the electron cyclotron resonance, which is important in physics (co-jointly with L.E. Pargamanik, 1947);
- He developed the theory of resonant nuclear reactions and the theory of diffraction of the scattering of charged particles by atomic nuclei (co-jointly with I.Ja. Pomeranchuk, «*Akhiezer – Pomeranchuk model*», 1948-1949);
- He determined the terms of evolutionary and sustainability criteria of MHD waves in the medium (together with G.Ja. Lyubarskii and R.V. Polovin 1948);
- He theoretically predicted exponential growth of the

fluctuations in the plasma by an electron beam (together with Y.B. Feinberg, «*beam plasma instability*», 1949);

- He has made a significant contribution to the development of the theory of electromagnetic shock waves in plasma (1949);
- He theoretically predicted splitting diffraction deuteron (nucleus of heavy hydrogen - deuterium contains one proton and one neutron [8, 15]) (together with A.G. Sitenko, 1955);
- He predicted theoretically effect of the magnet acoustic resonance in the material recognized in the USSR as a scientific discovery №46 with priority of 1956 and confirmed experimentally (together with V.G. Baryakhtar, S.V. Peletminskii, 1956);
- He Initiated research in the Soviet Union in the new Soviet scientists to the field of physical problem tasks by electronic acoustics (1956);
- He developed the theory of absorption of ultrasound energy in metals, insulators, and magnetic crystal substance (together with GY. Lyubarskii and M.I. Kaganov, 1957);
- He studied by calculations the scattering of electromagnetic waves on plasma fluctuations (together with A.G. Sitenko and I.G. Prokhoda, 1957);
- He built a refined theory of relaxation and kinetic processes in magnetically ordered crystals of substances (1959);
- He has made significant scientific contributions to the theory of linear accelerators of electrons and heavier particles - protons and ions (co-jointly with Y.B. Feinberg, N.A. Khizhnyak, G.Y. Lyubarskii, K.D. Sinelnikov and A.K. Walter, 1950-1960-s);
- He has developed a number of theories of quantum electrodynamics, and based on these calculated radiative corrections for a number of quantum electrodynamic effects in the interaction of elementary particles of high energy (together with R.V. Polovin, 1963);
- He calculated the number of the electromagnetic characteristics of hadrons (elementary particles subject to strong physical impact - baryons and mesons [8, 15]), and summarized the quark model of the structure of elementary particles based on electromagnetic processes (together with M.P. Rekalo, 1964);
- He developed the theory of scattering of pions (elementary particles that have a mass of about 270 electron masses of peace and non-carriers of nuclear forces of interaction in the material [8, 15]) in the matter of nuclear material (jointly with I.A. Akhiezer, 1964);
- He studied theoretically the radiation processes of channeled electrons and positrons in crystals of a substance (with N.F. Shul'ga and V.F. Boldyshev, 1974-1982);
- He developed the theory of quantum electrodynamic effects of interaction of particles in crystals of a substance (with N.F. Shul'ga).

Fig. 4. Academician of the Ukrainian Academy of Sciences A.I. Akhiezer (second from left) with his students, Doctors of Science and future Ukrainian academics in the field of theoretical physics during a discussion of obtained solution of important physical problem (from left to right: V.G. Baryakhtar, S.V. Peletminskii and K.N. Stepanov) (1960, UPTI-PTI, Kharkiv) [28]

That is the main course, and not quite complete list of significant physical achievements to the world-society scientific results of academician of Ukrainian Academy of Sciences (NASU) Akhiezer A.I. for many decades his active creative work in relevant areas of modern physics mentioned above. Formulated here in a concentrated form of outstanding scientific achievements and merits of Prof. A.I. Akhiezer (Fig. 5) to our countries, the national science and higher education were awarded the following honorable marks of distinction and high state awards [6, 9, 14]:

- Medal «For Valiant Labor in the Great Patriotic War of 1941-1945» (1945);
- Prize named after L.I. Mandelshtam of the USSR Academy of Sciences (for the book «*Some Problems in Nuclear Theory*», 1949);
- Order «Badge of Honor» (1954);
- Election of Corresponding Member (1958) and Academician of the Academy of Sciences of the Ukrainian SSR (1964);
- Two Orders of Red Banner of Labor (1971 and 1981);
- Prize named after K.D. of the Academy of Sciences of the Ukrainian SSR (for a cycle of works «*High-frequency relaxation processes in magnetic materials*», 1978);
- USSR State Prize in Science and Technology (for the work «*The discovery and study of dynamic phenomena associated with phonon interactions in magnetic crystals*», 1986);
- Honorary title «Honored Worker of Science and Technology of Ukraine» (1986);
- Diploma of the Presidium of the Supreme Soviet of the Ukrainian SSR (1991);
- Prize named after N.N. Bogolyubov of the NAS of Ukraine (for the series of works «*The quantum and stochastic evolutionary system in perturbation theory*», 1995);
- Order of Ukraine «For Merits» III-rd (1996) and II-nd (1999) degrees;
- International ITEP prize named after I.Ja. Pomeranchuk of the Russian Academy of Sciences (1998);

- Prize named after A.S. Davydov of the NAS of Ukraine (for the series of works «*The interaction of high-energy particles with nuclei and crystals*», 2000);
- State Prize of Ukraine in the field of science and technology (2002, posthumously).

Fig. 5. Academician of the Ukrainian Academy of Sciences A.I. Akhiezer in thoughts on the complex issues of domestic physical science, ways of its survival and future development in the current conditions (1970, KhPTI, Kharkiv) [7]

Kharkiv scientific school of theoretical physics. Academician of the Ukrainian Academy of Sciences (NASU) Akhiezer A.I. became the founder of the Kharkiv school of physics internationally recognized [11, 14, 28]. He paid great attention to the preparation of highly qualified personnel. As part of this scientific school under the scientific guidance of Akhiezer A.I. theoretical physicists have been successfully protected more than 72 Candidate and 33 Doctor theses [9, 11]. Representatives of this famous law school have been published in leading scientific journals of the USSR, Ukraine and abroad hundreds of scientific articles and dozens of monographs. Let us discuss some of these publications. So, the first scientific monograph published by A.I. Akhiezer in 1948 at the insistence of Academician I.V. Kurchatov, was the book «*Some Problems in Nuclear Theory*» (co-authored with I.Ja. Pomeranchuk). In 1953, by A.I. Akhiezer important book «*Quantum Electrodynamics*» (co-written with V.B. Berestetskii) was published. It was the first monograph, summarized the lessons in this experience of the world The cutting area of physical science. It has been translated into many languages and reprinted many times. In addition, A.I. Akhiezer personally and co-authored with his students and colleagues published the following monographs on current topics [6, 9, 11]: «*Spin Waves*» (together with V.G. Baryakhtar and S.., Peletminskii, 1968); «*Electrodynamics of plasma*» (co-authored with I.A. Akhiezer, R.V. Polovin, A.G. Sitenko and K.N. Stepanov, 1974); «*The course of general physics. Mechanics and molecular physics*» (co-authored by L.D. Landau and E.M. Lifshitz, 1969); «*Methods of Statistical Physics*» (co-authored with S.V. Peletminskii, 1977); «*Electrodynamics of adrons*» (co-authored by M.P. Rekalo, 1977); «*Biography of elementary particles*» (co-authored by M.P. Rekalo, 1983); «*Electromagnetism and electromagnetic waves*» (co-authored with I.A. Akhiezer, 1985); «*Fields and fundamental interactions*» (jointly with S.V. Peletminskii, 1986); «*Nuclear Physics*» (1988); «*Electrodynamics of nuclei* « (co-authored with A.G Sitenko and V.K. Tartakovsky, 1989); «*The theory of fundamental interactions*» (in collaboration with S.V. Peletminskii, 1993); «*From the rays of light to the colored quarks*» (co-authored with J.P. Stepanovski, 1993); «*Electrodynamics of high-energy matter*» (co-authored with N.F. Shul'ga, 1993); «*Nuclear Theory*» (co-authored with Yu.A. Berezhnoj, 1995); «*Introduction to the theory of the multiplier systems (reactors)*» (co-authored with I.Ja. Pomeranchuk, 2002), and others.

A number of students of Akhiezer A.I. became academicians and corresponding members of the Ukrainian SSR Academy of Sciences (NASU) [2, 6, 11]: V.G. Baryakhtar, D.V. Volkov, E.A. Kuraev, S.V. Peletminskii, A.G. Sitenko, N.F. Shul'ga, Yu.B. Feinberg, P.I. Fomin, K.N. Stepanov, etc. We also point out the fact that at present Academician of the National Academy of Sciences of Ukraine Victor Grigirievich Baryakhtar (see Fig. 4) leads the Institute of Magnetism, National Academy of Sciences of Ukraine (Kyiv), Academician of the National Academy of Sciences of Ukraine Nikolai Fedorovich Shu'lga - Institute for Theoretical Physics named after A.I. Akhiezer of the NSC «KhPTI» NAS of Ukraine (Kharkiv), created on January 31 1996 on the basis of Presidential Decree of 23 June 1993 [2, 29]. The name of Academician of NASU A.I. Akhiezer to the Institute for Theoretical Physics - ITF) was awarded the corresponding resolution of the Cabinet of Ministers of Ukraine in 2003.

Numerous students, the scientific community of the KhPTI-UPTI and leading universities of Kharkov, which is one of the largest centers of education and science of Ukraine, warmly welcomed the outstanding theoretical physicist of our time, academician of Ukrainian Academy of Sciences (NASU) Akhiezer A.I. in the jubilee celebrations of its 60th, 70th and 80th birthday, continued to actively work in the workplace (Fig. 6, 7) [30, 31]. Fig. 8 sealed with friends on the life and work together, theoretical physicists KhPTI, Academy of Sciences of the Ukrainian SSR A.I. Akhiezer and D.V. Volkov, has done much for the formation of the Kharkov school of theoretical physics, the development of physical science in the USSR and Ukraine and to strengthen their defense capability [9].

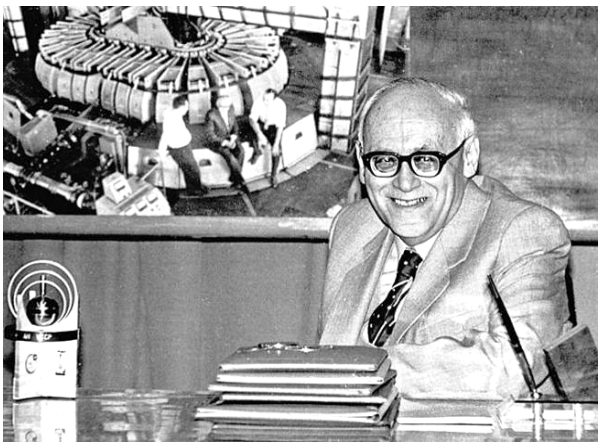

Fig. 6. Science master, Academician of the Academy of Sciences of the Ukrainian SSR A.I. Akhiezer accepting congratulations from colleagues on the day of celebration of its 70th anniversary and the solemn meeting on this important for the scientific community of the anniversary event of the Academic Council of the KhPTI (October 1981 KhPTI, Kharkiv) [7]

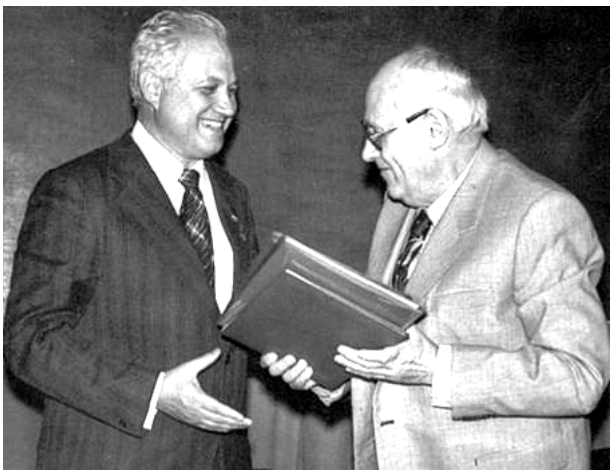

Fig. 7. Academician of the Ukrainian Academy of Sciences Akhiezer A.I. (right) at a meeting of the Academic Council of the KhPTI accepts congratulations on the occasion of his 70th birthday (anniversary address to his teacher presents his talented student-Academician of the Academy of Sciences of the Ukrainian SSR Baryakhtar V.G. (left), October 1981, KhPTI, Kharkiv) [28]

Fig. 8. Kharkiv theoretical physicists, academicians of the Academy of Sciences of the Ukrainian SSR Akhiezer A.I. (left) and Volkov D.V. (right) in their office at the KhPTI laboratory building on the old site of the Institute on the Tchaikovsky Street during discussion materials of a new problem task (1991, Kharkiv) [7]

After retiring to the well-deserved retirement home and rest, Alexander Ilyich, despite his practical blindness in the late 1990s (made surgery his vision is not saved), thanks to a clear mind, his technical secretary while her own daughter Zoya Alexandrovna Spolnik constantly supported human and scientific contacts with his native ITF NSC «KhPTI» of the National Academy of Sciences of Ukraine (above all, with his faithful disciples, and who became well-known scientists – S.V. Peletminskii, N.F. Shul'ga and K.N. Stepanov) [28, 32]. Fig. 9 shows one such case involving Academician of the NASU A.I. Akhiezer at the KhPTI in the celebrations on the occasion of the 90th anniversary of the birth of Lev Davidovich Landau [28].

Fig. 9. Academician of the National Academy of Sciences of Ukraine A.I. Akhiezer at a meeting of the Academic Council of the KhPTI shares his memories of the great theoretical physicist of our time, and his teacher Lev Davidovich Landau, 90-year anniversary of the birth of which were dedicated to the solemn gathering data Institute of scientific and technical community, universities and Kharkiv as a whole (January 1998, KhPTI, Kharkiv) [7]

Features of the personality and lifestyle of the Kharkiv physicist. American theoretical physicist, Prof. L. Tisza (1907-2009) who worked in the 1930s together with A.I. Akhiezer at the theoretical department of the UPTI, headed by then L.D. Landau, in his memoirs of 2001 as one of the «old» witness of our hero-scientist noted after-following [10]: *«... He has kept the tradition of LD Landau in both quality and breadth of applications in all areas of theoretical physics. L.D. Landau, obviously proud of them.* « Remembering his teacher, academician of Ukrainian Academy of Sciences (NASU) A.I. Akhiezer, its talented students, academicians of the NASU V.G. Baryakhtar (born in 1930) and S.V. Peletminskii (born in 1931) said [28, 33]: «*... He was a wonderful teacher, he was a teacher who knew all of physics, he was strict and demanding teacher, and he loved us as his children.*» Alexander Ilyich disciples often commemorated [28]: *«... We have to work as hard and very carefully considered presentation of the results. It is necessary to carefully choose the place of their publication. Must be able to listen to criticism of opponents.* « He was considerate to their employees (Fig. 10), defended their leading lights in all offices and able to appreciate them. He constantly planted them the

following principles of scientific research [28]: «*To master a new research technique. Have the courage to abandon their results, even if you have already received the approval of the classics of natural science. Be able to appreciate the discussions with colleagues.* « Teaching at KSU-KNU named after V.N. Karazin and the Military Radio Engineering Academy Alexander Ilyich was a holy thing throughout his life. By teaching activities and he drew his venerable pupils [28]. He loved the young student and loved to lecture for it [16, 28]. Communication of A.I. Akhiezer with students always gave him considerable pleasure. In the circle of colleagues, he stuck to the rigid position of principle [28]: *«... If you do not like students, you have to throw a teaching job immediately. It is impossible to assert itself on the students. It is immoral*». Alexander Ilyich was a demanding teacher of high school. It is extremely transparent and available to explain complex material to their students. He said that it is necessary to explain the material [16]: *«... In the workers and peasants, so that the proletariat was clear.*» He loved a good joke and humor. Jokes have been a part of his lectures. This scientist made his memorable lecture. He believed that «sometimes it is necessary to give a student a break from the note-taking, so you must do in the lecture breaks the story of a joke or a story of life» [16]. Used in its vocabulary a long time memorable utterances [16]: «*What field is quantized, still get ... zero!*» Too good for students and colleagues Alexander Ilyich was not.

Fig. 10. One of the last photos of lifetime of Academician of the NASU Akhiezer A.I. on his birthday, October 31, 1999, made in the work on the site of the old office of the scientist at the KhPTI, Tchaikovsky Street (from left to right: A.P. Rekalo, N.F. Shul'ga, A.A. Yatsenko, L.N. Davydov, A.I. Akhiezer, Z.A. Spolnik - daughter of Alexander Ilyich Akhiezer, L.G . Zazunov, S.V. Peletminskii, K.N. Stepanov and A.N. Akhiezer - son of mathematician Naum Ilyich Akhiezer) [7, 28]

He «*did not suffer any falsehood, sometimes he was ready to literally crush the interlocutor. Usually good-natured Akhiezer was able to demonstrate uncompromising-ness and stiffness* « [16]. Careerism Alexander Ilyich never differed. An important finishing touch to his portrait is that he «*never tried to be sure to enter themselves in the co-authors of the work and did not go on the necks of graduate students*» [16]. He was interested not only in physics. He was interested in any achievements of scholars of natural sciences. He showed great interest in the biographies of famous scientists around the scientific world. Alexander Ilyich knew Russian and foreign classical literature. He loved and highly appreciated classical music [16]. His favorite work in the field you specified earlier for the urgent and complex society for the study of modern physics sections was the main purpose of the whole of his long life and successful scientific work. According to the memoirs mentioned just above close to him in the human spirit of his favorite students, academics [28, 33]: *«... He never engaged in advertising their work, their results «never puffed out his cheeks», and could not stand people who «inflate» cheeks. He never betrayed the interests of science, education, interests, and, of course, friends.* « Friends, colleagues, relatives were with him - this outstanding Ukrainian scientist-physicist and a remarkable man to his last breath, and physical presence in our earthly life.

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