

## Opening address

L B Okun

May 20, 2013 marks the centenary of the birth of Isaak Yakovlevich Pomeranchuk, the world-famous theoretical physicist, the founder of the Theory Department at ITEP. In commemoration of the centenary, M I Vysotsky and A S Gorsky organized a memorial seminar at ITEP. The texts of the talks given at this seminar are published below. This opening address is aimed at reminding the reader of the basic contributions Pomeranchuk made to physics.

**Dau and Chuk.** These two names were introduced by Lev Davidovich Landau, who used the endings of his name and the name of his first disciple. Chuk treated his Teacher with deepest respect. And this feeling was mutual.

**Akhiezer and Pomeranchuk.** From the Foreword to the first edition of their joint book, *Certain Problems of Nuclear Theory* (1948) [1a] (popular among students, but not only students, of the 1950s under the contracted names ‘Akh and Pomer’): “The theoretical study into the properties of atomic nuclei is at present at the very early stage because of the absence of an exact theory of nuclear forces. There exist, however, such nuclear processes many of whose properties do not depend on the detailed pattern of interaction between nuclear particles. The present book is devoted to a consideration of such processes. The main emphasis is put on processes involving neutrons.” From the Preface to the 2nd edition of the same book (1950) [1b]: “The revisions and additions to the first two chapters devoted to neutron–proton interaction and the statistical properties of heavy nuclei are particularly important.”

The book by A I Akhiezer and I Ya Pomeranchuk, *Introduction to the Theory of Neutron Multiplicating Systems (Reactors)*, was only published in 2002 after their death, as edited by B L Ioffe and A S Gerasimov [2]. The excerpt from the Editors’ Foreword to the book reads: “The book was written in 1946–1947 in Laboratory No. 3 (now ITEP) and was the first book, not only in the USSR, but also in the world, in which the theory of nuclear reactors was posed systematically and at a high theoretical level... In particular, this refers to the resonance absorption theory formulated by I I Gurevich and I Ya Pomeranchuk in 1943... In the popular literature, one can often come across the assertion that the



F Dyson, I Ya Pomeranchuk, L D Landau, and others at the Institute for Physical Problems. Second half of 1950s (photo taken by R E Peierls).

Soviet Atomic Project could only have been realized with the information that had come from abroad—from the USA, England, and Canada—through the secret service. The book by A I Akhiezer and I Ya Pomeranchuk proves that this is not so. After the book had been written (more precisely, when it has been writing) in 1947, it was classified as secret, placed in a secret archive in two or three copies partially typed and partially written by hand. The book was declassified in the 1960s. By that time, however, the authors had already lost interest in it and did not undertake its publication, and the book was misled in archives. Recently, one of us (BI) managed to find it in ITEP’s archive.”

**I Ya Pomeranchuk. *Collection of Scientific Work*** in 3 vols (1972) [3]. To perpetuate the memory of Isaak Yakovlevich, his disciples and colleagues published a collection of his scientific work edited by V B Berestetskii: Volume I (*Low-Temperature Physics. Neutron Physics*) contained V B Berestetskii’s foreword and the following sections: 1. Theory of metals. 2. Properties of insulators. 3. Bose and Fermi liquids. 4. Neutron scattering and absorption. General theory of scattering (33 articles); Volume II (*Elementary Particle Physics: Electromagnetic and Weak Interactions*) contained the sections: 1. Theory of photons, electrons, and muons. 2. Passage of charged particles through a substance. Cosmic rays. Magneto-bremsstrahlung radiation. 3. Quantum field theory. 4. Physics of strange particles and resonances. Weak interactions (79 articles); Volume III (*Elementary Particle Physics: Strong Interactions*) consisted of the sections: 1. Peripheral interactions. 2. Diffraction processes. 3. Strong interactions at asymptotically high energies (123 papers).

**Reminiscences about I Ya Pomeranchuk (1988) [4].** The reminiscences were written by the authors who knew Isaak Yakovlevich beginning in 1932 (A K Kikoin, L N Kurbatov, N E Alekseevskii, M A El’yashevich, A I Shal’nikov, P E Spivak, Ya B Zel’dovich); beginning in 1936 (A I Akhiezer, R E Peierls, I E Nakhutin, V S Shpinel, A B Migdal, I I Gurevich, L Van Hove, S Ya Nikitin, Ya A Smorodinsky, M S Kozodaev, E L Feinberg, S S Alikhanova, M K Pavlova, N A Burgov, E L Andronikashvili, G N Flerov, M G Meshcheryakov); beginning in 1946 (A D Galanin, L L Gol’din, Yu G Abov, G M Kukavadze, I P Semenov, V I Kogan, V Ya Fainberg, A P Rudik, B L Ioffe, I S Shapiro, A A Abrikosov, I M Khalatnikov, M A Ivanova-Pomeranchuk, V P Dzhelepov, N N Bogoliubov, B M Pontecorvo, S M Bilen’kii, L I Lapidus, D V Shirkov, K A Ter-Martirosyan, L B Okun, I S Tsukerman, I Yu Kobzarev,



At the Institute for Physical Problems (1956) (photo taken by V F Weisskopf).

Yu A Vdovin, I M Dremin, D Amati); and his colleagues who knew him only beginning in 1956 (R E Marshak, Yu A Simonov, V S Popov, A B Kaidalov, E D Zhizhin, Yu P Nikitin, V D Mur, M F Lomanov, B M Karnakov, A A Anselm, S G Matinyan, L G Landsberg, I I Levintov, G A Leksin, Ya I Granovskii, I B Khriplovich, S Drell, A Salam, R A Salmeron, A Martin, V F Weisskopf, M L Goldberger, K Strauch, J Bjorken, A I Ruderman, V N Gribov). Published in the same collection are the scientific reviews: Okun L B “I Ya Pomeranchuk’s work on elementary particle physics”; Ioffe B L “I Ya Pomeranchuk’s work on quantum field theory”; Galanin A D “I Ya Pomeranchuk’s work on the physics of nuclear reactors and the influence of his ideas on the further development of the theory”; Kulipanov G N and Skrinsky A N “Synchrotron radiation and its application”; Andreev A F “Physics of quantum liquids and crystals”; Gurevich V L “I Ya Pomeranchuk’s work on the theory of thermal conductivity of crystal dielectrics”. The *Reminiscences of I Ya Pomeranchuk* also present a list of scientific studies and the main dates marking the life and activities of I Ya Pomeranchuk (published also in *Sov. Phys. Usp.* **10** 409 (1967) [5]), as well as “A Word of Farewell” by V B Berestetskii.

**I Ya Pomeranchuk Prize.** Beginning in 1998, an international jury has been awarding annually two I Ya Pomeranchuk prizes. To date, the prize winners have been A Akhiezer, S Drell (1998); K Ter-Martirosyan, G Veneziano (1999); E Feinberg, J Bjorken (2000); L Lipatov, T Regge (2001); L Faddeev, B DeWitt (2002); V Rubakov, F Dyson (2003); A Andreev, A Polyakov (2004); I Khriplovich, A Vainshtein (2005); V Kuzmin, H Georgi (2006); A Belavin, Y Nambu (2007); L Okun, L Susskind (2008); B Ioffe, N Cabibbo (2009); V Zakharov, A Martin (2010); S Gershtein, H Leutwyler (2011); S Belyaev, J Maldacena (2012); A Slavnov, M Shifman (2013).

An impressive International Conference “I Ya Pomeranchuk and Physics at the Turn of the Century” [6] was held in 2003. The memory of the remarkable scientist and man, Isaak Yakovlevich Pomeranchuk, has been carefully preserved by his disciples.

## References

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3. Pomeranchuk I Ya *Sobranie Nauchnykh Trudov* (Collection of Scientific Works) In 3 volumes (Exec. Ed. V B Berestetskii) (Moscow: Nauka, 1972)
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6. Berkov A, Narozhny N, Okun L (Eds) *I Ya Pomeranchuk and Physics at the Turn of the Century. Proc. of the Intern. Conf., Moscow, Russia, 24–28 January 2003* (Singapore: World Scientific, 2004)