
*Science should be fascinating, fun and simple.
Scientists should be the same.*
P. L. Kapitsa

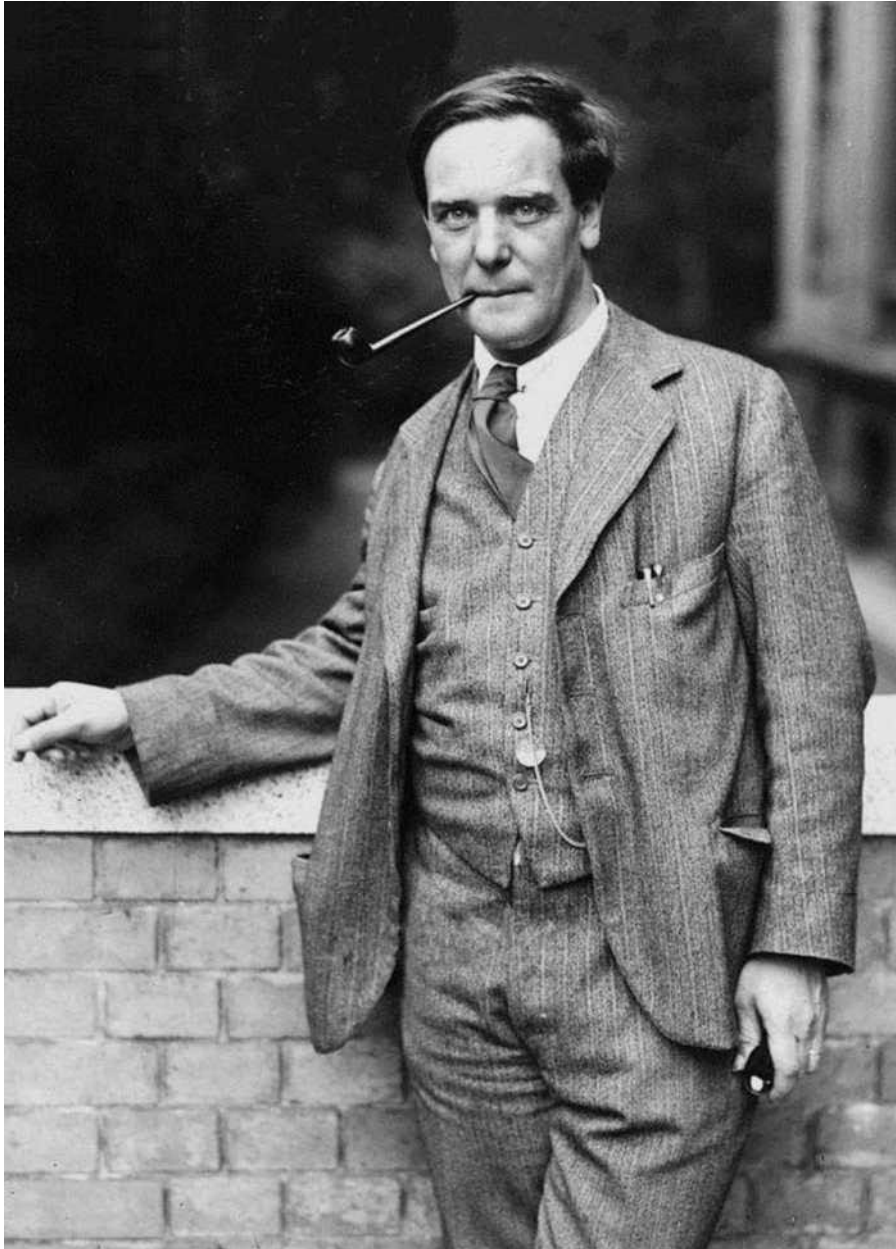


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To the 130th anniversary of Pyotr Leonidovich Kapitsa

EDITORIAL

July 8 marks the 130th anniversary of P. L. Kapitsa's birth. Pyotr Leonidovich is known for pioneering fundamental experiments in physics. His discovery of superfluidity undoubtedly belongs to the most brilliant achievements of 20th-century physics. His engineering developments in the field of ultra-strong magnetic fields, oxygen industry, and high-power electronics are of enormous importance.

He was an innovator in organizing physics and mathematics education, one of the founders of Phystech with its system of basic departments. This system provided a fundamentally new approach to training scientists, researchers, and designers. His civic position and public activities, work at the USSR Academy of Sciences at critical moments helped to rescue talented physicists from trouble and captivity. Kapitsa created one of the world's best research centers for fundamental physics – the Institute for Physical Problems of the USSR Academy of Sciences (now RAS). At the Institute, he gathered a team of capable physicists and created an atmosphere of free creativity, in which the work of scientists was extremely effective and fruitful. For many years, from 1955 until his death in 1984, he was the permanent editor-in-chief of our journal.

The personality of P. L. Kapitsa has attracted the attention of people worldwide for many years, regardless of their age and specialty. We present here excerpts from a short essay by Academician A. F. Andreev about Pyotr Leonidovich. The essay was prepared for the 100th anniversary of P. L. Kapitsa's birth and published in the fourth issue of the journal *Priroda* in 1994. This vivid presentation by a brilliant scientist who belonged to Kapitsa's scientific community continues to be absolutely contemporary and moving even 30 years after it was written and more than 40 years after Pyotr Leonidovich's death.

We thank all the authors who participated in creating this anniversary issue of JETP.

From the essay "A Word About Kapitsa," Priroda, "Nauka" Publishing House of RAS, (1994).

*Academician A. F. Andreev,
Director of the Institute of Physical Problems*

Kapitsa endured many sufferings but also achieved many victories, both in scientific and human terms. Despite Peter Leonidovich's deep individuality, or perhaps because of it, his fate vividly reproduces the picture of his time. It reflected everything that happened with and around our science in the 20th century.

Peter Leonidovich Kapitsa lived a long life. He died in 1984, three months short of his ninetieth birthday. Facing today's difficulties, we try to imagine how he would have acted in our place. This is our "criterion of truth."

Of course, first and foremost, Kapitsa is a great physicist and engineer. His work in physics and technology of low temperatures and strong magnetic fields, in superfluidity of liquid helium is classic. However, Kapitsa is more than just a physicist, more than a classic of science.

Peter Leonidovich's life coincided with a period of our history marked by outstanding scientific progress. We had remarkable science in many fields! On one side of the scale, there was unprecedented prestige of scientists and elevation of science to the rank of state ideology, and on the other – the humiliating pressure of dictatorship and constant threat of aggression from ruling ignorance. P. L. Kapitsa experienced all this firsthand, and under these conditions, he considered it his duty to monitor the state of these scales, noting how authority viewed science, how science influenced authority, and how both were reflected in public opinion.

Scientific work was Kapitsa's main interest, it constituted the meaning of his life, from it he derived the greatest pleasure and would become furious when he saw obstacles in the path of its development. To remove these obstacles, he wrote letters to the country's leaders, tried to influence the formation of scientific policy. Kapitsa was neither a conformist nor a dissident.

He had the courage and did not consider it hopeless to teach how science and scientific workers should be treated. And he knew how to position himself so that his voice was heard and his word carried weight. Thanks to this, he managed to rescue and save L. D. Landau and V. A. Fock from prison.

Kapitsa attached great importance to the authority of scientists in the eyes of society. He did much to ensure that science was perceived as part of universal human culture. The Institute for Physical Problems was a true cultural center. The famous seminars of Kapitsa and Landau attracted physicists not only from Moscow but also from many other cities of the country, and on Wednesdays and Thursdays one could meet colleagues and friends from Leningrad, Kharkov, Novosibirsk, Kazan, Krasnoyarsk, and Tbilisi at the IFP. Famous artists and writers gladly visited the institute at Pyotr Leonidovich's invitation. Exhibitions of young artists were also held here.

Reflecting on what most determined Kapitsa's weight in science and society, it's difficult to focus on just one thing. There are many record holders by a single parameter.

Among his contemporaries, there were many outstanding scientists. Kapitsa was not the only one concerned with the state of science and its reputation. He was not the only one who was brave and independent. But it's hard to name another figure of the same scale. Kapitsa's uniqueness lay in the fact that he operated on many parameters simultaneously and always achieved optimal results.

Meanwhile, Pyotr Leonidovich was not at all protected from the blows of fate. On the contrary, his life was dramatic. In hungry post-revolutionary Petrograd, he lost his father and his first family – wife, son, and daughter. He had to start almost "from scratch" five times.

First — in post-revolutionary Petrograd at A. F. Ioffe's Institute, second — in Cambridge under E. Rutherford, then — in Moscow, after he was forbidden to return to England in 1934, where the London Royal Society had built a special laboratory for him. In 1946, after a clash with Beria, he was removed from his position as head of Glavkislod, which he had organized during the war years, and was deprived of the opportunity to work at the institute he had created. It was then that he built a laboratory at his dacha in Nikolina Gora, where he conducted original research in hydrodynamics (wave flow of thin liquid layers), mechanics (Kapitsa's pendulum), and high-power electronics. Finally, in January 1955, he again became director of the Institute for Physical Problems and began studying plasma properties.

Kapitsa's example makes us wonder whether we are exaggerating the power of external disturbances that interfere with scientific work today. There were no fewer obstacles in Kapitsa's time and in his personal experience. But he possessed a remarkable quality that many of us lack so much — the ability to disconnect and switch. He could not exist without his institute, and he also had the gift of feeling the pulse of time, its needs and possibilities.