Lev Petrovich Pitaevskii Science, Conscience, and Courage in the Soviet State

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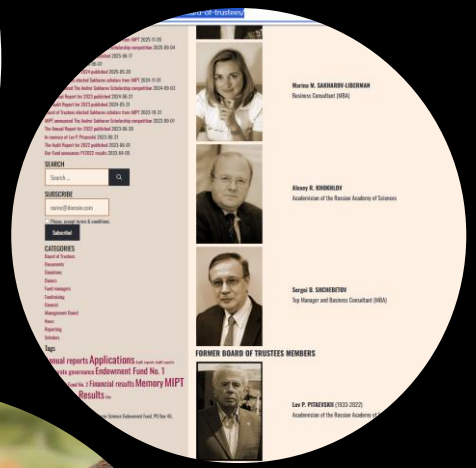
- Knew Lev Petrovich Pitaevskii since 1970 when Pyotr Kapitsa invited him to join the Institute.
- Shared the second-floor office at the Theoretical Department for many years.
- Supervised PhD students jointly with Lev Pitaevskii.
- They worked side by side from 1970 until 1991, when Michael accepted a position in Sweden. The following year, Lev Petrovich left Russia and settled permanently in Trento in 1998.
- They remained in regular contact, with Pitaevskii and his wife Luba, visiting Sweden on a couple of occasions.

Theoretical Department in Flat 1

Visit of Paul Dirac in 1972

MGU physics graduate,
Stanford MBA,
VP of The Andrei Sakharov Foundation



- Knew Lev Petrovich Pitaevskii as long as I can remember – shared interests in mushroom hunting and cats (science and culture came later).
- Lev Pitaevskii served as a Trustee at an endowment which Marina created in 2020. Now in its sixth year, the Endowment pays up to 26 annual scholarship for talented PhD students https://sakharov.fund/en/
- Marina carries on with scientific programming beyond the original endowment: physics scholarships and fellowships at leading universities across four countries, with another 15-25 annual awards.

Lev Pitaevskii: Early years in Saratov

Distance to Moscow: 723 km
Population: 212,000 in 1926 → 372,000 in 1939

Born on January 18, 1933, in a family of economics professor

Went to school 1940-1950

UDHR incident in 1948

Studied Physics at Saratov University (where his father was a professor) in 1950-1955

took the entire set of **9 exams of "Theoretical Minimum"** designed by Lev Landau (only 43 physicists succeeded in taking the whole set)

Invited for his PhD studies by Lev Landau

Education milestones: Saratov

Student ID card Saratov University, 1951

In 1948, as a fifteen-year-old schoolboy, Lev Pitaevskii and a group of friends decided that the adoption of the Universal Declaration of Human Rights was news too important to ignore — and wrote about it in their school newspaper.

That the USSR had abstained rather than signed was, to them, beside the point. "Human Rights" was at best a bourgeois concept in Stalin's Soviet Union, and the boys were promptly detained by the KGB.

They were released only through the timely intervention of a well-

Lev Pitaevskii (right) with other graduates awarded gold medals in Saratov in 1950.

Despite a terrifying brush with the KGB in 1948, Pitaevskii graduated from school with honors, receiving a gold medal, and was admitted to Physics Department of Saratov University in 1950.

1948

1955

In 1955, he graduated from the University and was invited by Landau to continue his studies in Moscow.

PhD candidate at Kapitsa Institute for Physical Problems: 1955 – 1958

Lev and his wife Lubov. Saratov, 1953

Married while still at the university, Pitaevskii and his wife Luba arrived in Moscow in 1955.

Pitaevskii joined a tiny and highly selective Theoretical Department at Kapitsa Institute.

Lev Landau, who was awarded Nobel Prize in Physics in 1962, was Head of the Department

Evgeny Lifshits, Landau's co-author of the world-famous 10-volume series *Course of Theoretical Physics*, supervised his PhD.

In 1958, Pitaevskii earned his PhD for his work on the theory of superfluid ^{4}He.

Due to a lack of Moscow residence permit, Pitaevskii had to take a position at **the Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation** in Troitsk, some 30 miles south of Moscow.

1960: Back at Kapitsa's Institute for Physical Problems

Pitaevskii spent 1958–1960 at IZMIRAN (the Ionosphere and Radio Wave Propagation) outside Moscow.

Using his considerable gravitas, Kapitsa insisted on solving his scientists' problems — according to Pavel Rubinin, his PA for many decades, he considered yielding to Soviet bureaucrats "an insult to his authority".

Eventually, in 1960, Kapitsa solved Pitaevskii's registration problem in a most inventive way. At a banquet at the Kremlin for Soviet elites held by Nikita Khrushchev, Kapitsa remarked that a brilliant young scientist, akin to the legendary polymath Mikhail Lomonosov, could not serve science for lack of a Moscow registration permit. Khrushchev immediately gave orders to grant one, and Kapitsa was able to hire Pitaevskii at the Institute for Physical Problems.

Institute of Physical Problems: Kapitsa, the legendary director

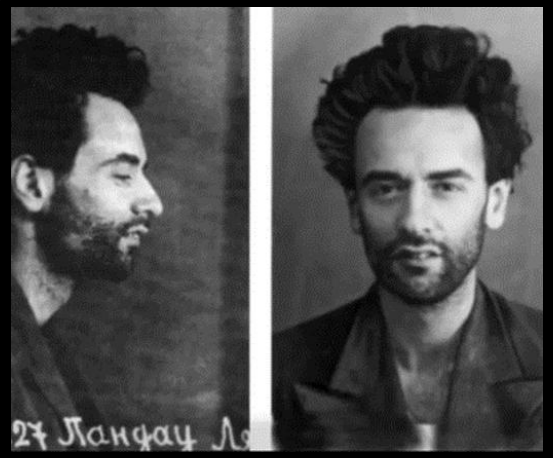
Physics professors and students at Cavendish Laboratory in 1934 - but Kapitsa could no longer join them

- Pyotr L. Kapitsa, a favourite student of Lord Ernest Rutherford at Cavendish Lab at Cambridge University and a Physics Nobel Laureate (1978 Prize).
- Rutherford earned his famous moniker, “The Crocodile” from Kapitsa, a mix of playful respect and intimidation — ever since the Crocodile graces the building of the Cavendish Laboratory.
- Later, Kapitsa in turn earned the moniker “The Centaurus” from his colleagues in Moscow.

Formation of the Institute for Physical Problems

- Kapitsa's productive years at Cambridge University came to an abrupt halt in the summer of 1934 – he arrived to visit his mother and was denied a permit to leave the USSR.
- Initially, Kapitsa thought it a misunderstanding and hoped to return to the Mond Laboratory, to his wife and two children and to his life at Cambridge. When it became clear that he would not be permitted to return, a deep depression set in.
- As his equipment for high-magnetic field research remained in Cambridge (although later Ernest Rutherford negotiated with the British government the possibility of shipping it to the USSR), he changed the direction of his research to the study of low temperature phenomena, beginning with a critical analysis of the existing methods for achieving low temperatures. In 1934 he developed new and original apparatus for making significant quantities of liquid helium.
- In part using equipment which the Soviet government bought from the Mond Laboratory in Cambridge (with the assistance of Rutherford), Kapitsa was allowed to build his own institute in Moscow – which he hoped to model on a college at his beloved Cambridge University.

Lev Landau was arrested at the peak of repressions for counter-revolutionary activity.

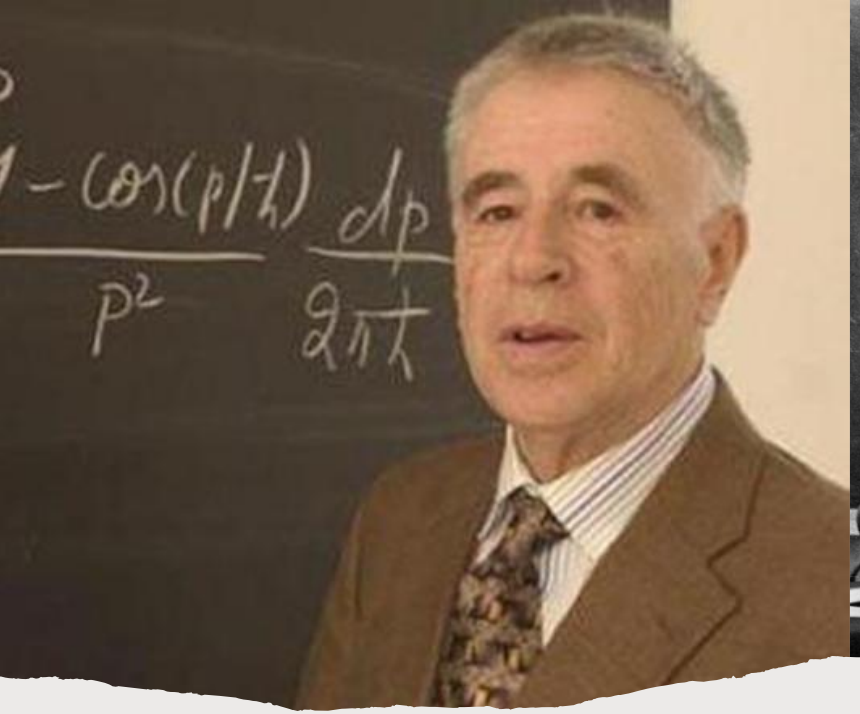


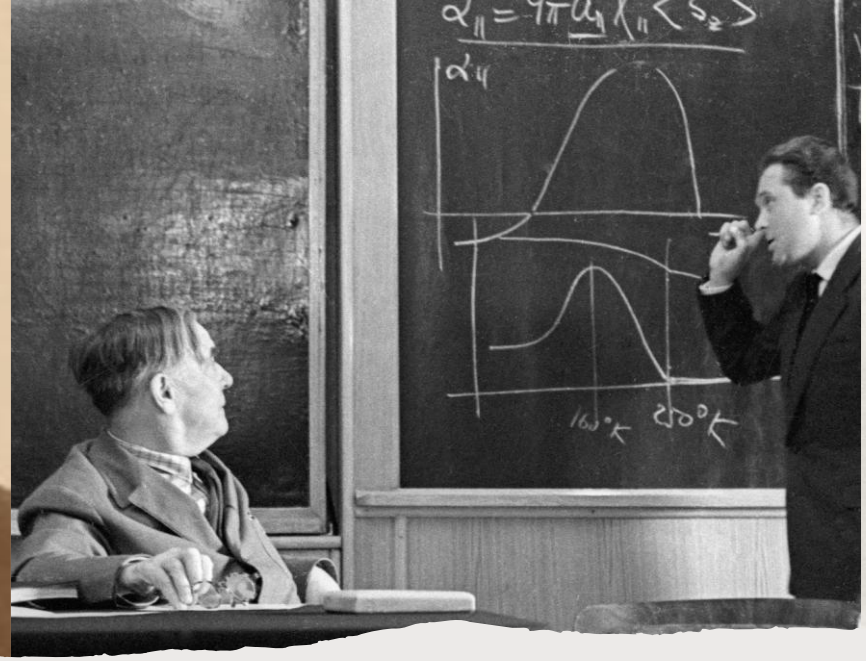
As one of the politically best-connected Soviet scientists, Kapitsa managed to secure certain privileges for his institute. Not only did he advance the industrial application of his inventions, but he managed to save several scientists from prison, including two of the nation's best theoretical physicists, Vladimir Fock and Lev Landau.

He found himself a captive in the USSR in 1934 - the mass terror of Stalinist repressions was setting in. No one was safe. Kapitsa, who had lived abroad, was at a high risk himself. Yet, he risked his own life to save others.

On April 6, 1938, Kapitsa sent a letter to Molotov, Stalin's deputy, and on April 28 to Stalin himself. Finally, on April 28, 1939, Kapitsa personally went to the Kremlin and threatened to retire from the position of head of the Institute for Physical Problems. The same day, Landau was released. It took a full year of persistent campaigning, not a single intervention.

Worth noting: Niels Bohr also wrote to Stalin on Landau's behalf in September 1938, so it was an international effort — though Kapitsa's threat to resign was almost certainly the decisive lever.





MIPT Students after the exams on the porch of Kapitsa Institute

Institute for Physical Problems: Furthering Physics Education

- Immediately after the war, a group of prominent Soviet scientists (including Kapitsa in particular) lobbied the government to create a new technical university, the Moscow Institute of Physics and Technology (MIPT). Kapitsa taught there for many years.
- Lev Pitaevskii also became an MIPT professor, teaching many courses, such as Statistical Physics.

The Institute for Physical Problems

The Physical Laboratory

By the director's insistence, no hierarchy in the frame — Nobel laureates and mechanics side by side.

An Oasis of Free Thought: The Institute Under Kapitsa

- The Institute for Physical Problems was unique in Soviet science not only for assembling a constellation of physicists of the first rank. Its director, Pyotr Kapitsa, shaped it into something rarer still — a pocket of intellectual freedom in an ideologically policed state.
- When genetics was suppressed under Lysenko's dominance of Soviet biology, it was at the Institute that seminars on the banned science were held — and only a personal call from Kapitsa to Khrushchev secured permission for them to go ahead. Kapitsa publicly pushed the boundaries of tolerated speech, lending his support to genetics and other causes the Soviet establishment would have preferred kept quiet.
- His protection extended beyond science: he cultivated friendships with leading figures of the arts — writers, painters, theatre directors — offering them the kind of frank exchange and quiet solidarity that was difficult to find elsewhere.
- He is also said to have refused to allow a "first department" on the Institute's premises — the mandatory KGB post embedded in Soviet institutions to serve as a first line of ideological surveillance — a refusal that would have required the same combination of personal courage and carefully husbanded political capital that marked everything he did.
- He had already demonstrated that capacity in full when, in 1939, he personally went to the Kremlin and threatened to resign unless Lev Landau — arrested on charges of espionage — was released. Landau walked free the same day.
- That capital was deployed, time and again, in defence of individual scientists. In November 1981, with Sakharov and his wife deep into a hunger strike in internal exile in Gorky, Kapitsa sent a personal telegram to Brezhnev: "He is a difficult character, but he has done a lot for our country. Save Sakharov — good deeds are never forgotten." The carefully worded appeal, framing the case in terms the General Secretary might hear, worked. Sakharov's demands were met, and the hunger strike ended after seventeen days.

Kapitsa receives the Nobel medal in 1978

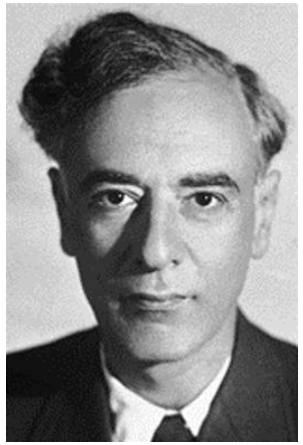
Heads of the Theoretical Department

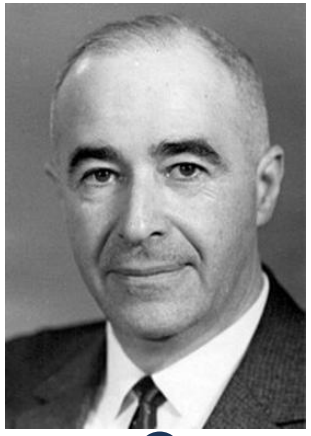
P.L. Kapitza Institute for Physical Problems, Russian Academy of Sciences

Lev Landau

1938 – 1968

Nobel laureate and titan of theoretical physics. Led the Department from 1938 until a tragic car accident in 1962; formally replaced only after his death in 1968.





Ilya Lifshitz

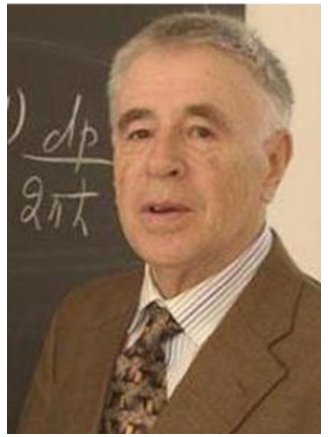
1968 – 1982

Brother of Landau's co-author Evgeny Lifshitz. A brilliant theoretical physicist of exceptional personal qualities.

Yakov Zel'dovich

1982 – 1987

An "outside" hire of Kapitza and a legendary theoretical physicist. Led the Department until his sudden death in December 1987.



Lev Pitaevskii

1988 – 1992

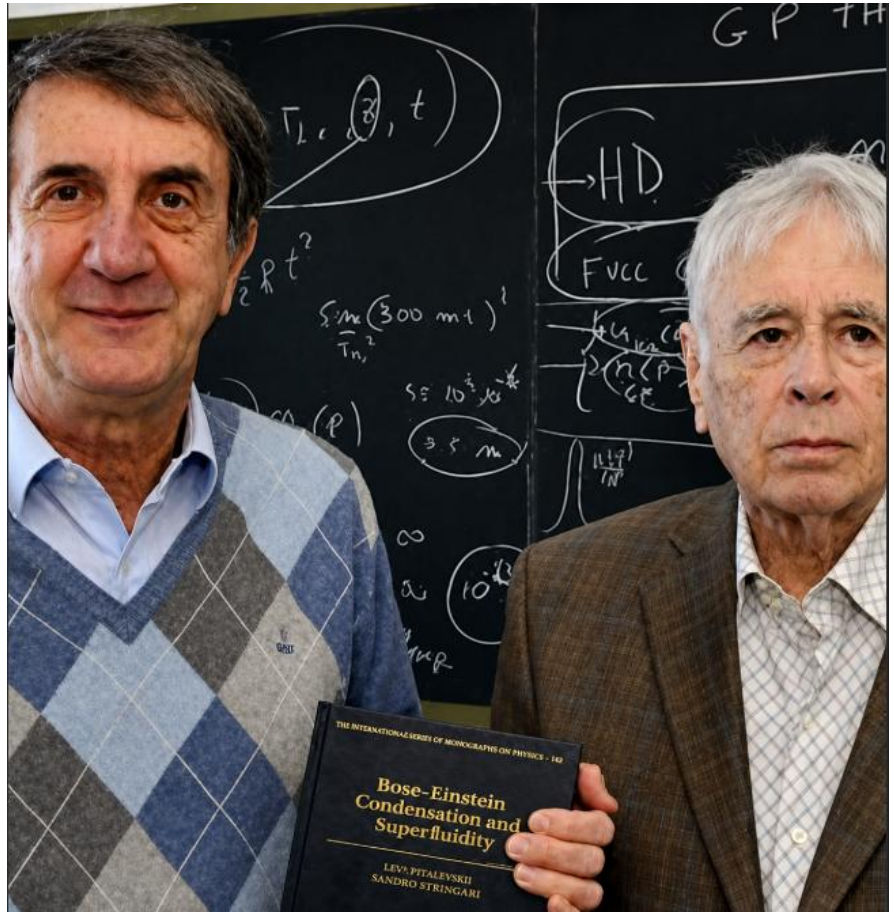
Much admired and respected Head. His tenure ended with his departure from Russia.

The collapse of Russian science in the 1990s

- Lev Pitaevskii belonged to the cohort of Russian scientists who left the country during the collapse of Russian science in the 1990s — an extraordinary crisis, with real-terms funding falling by roughly 80% in just a few years.
- Between 500,000 and 800,000 scientists left the country.
- Not all departures were purely economic. Some scientists who left in the 1990s had wanted to leave during the Soviet period but couldn't; liberalisation made emigration possible for the first time. The economic collapse accelerated and expanded this flow.

Lev Pitaevskii: From a Schoolboy's Courage to a Flourishing in Italy

- On many private occasions and in some interviews, Pitaevskii called Italy his second motherland.
- When the Soviet Union collapsed and Russian science went into a period of severe institutional decline in the 1990s, Pitaevskii left for Trento, where a new collaboration awaited him.
- What followed was a remarkable late flowering. In 1999, together with Franco Dalfovo, Stefano Giorgini, and Sandro Stringari, he published "Theory of Bose-Einstein Condensation in Trapped Gases" in *Reviews of Modern Physics* — a paper that became one of the most cited in the field, and the foundation of a collaboration that would yield around a hundred further publications.



It is tempting to wonder whether the intellectual atmosphere of those Italian years contributed something beyond mere geography. A man who had been detained at fifteen for writing about human rights, who had lived and worked for decades in a society saturated with surveillance and ideological pressure — even in the relative shelter of Kapitsa's Institute — might reasonably have felt, in Trento, a particular lightness.