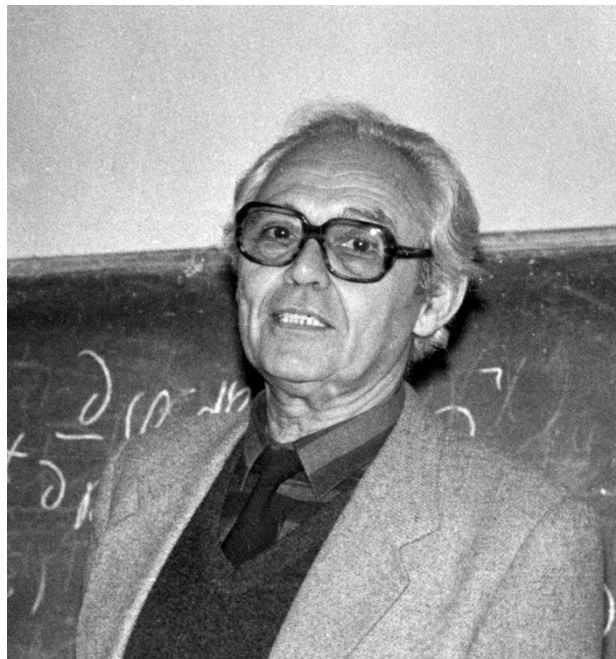


Moisey Isaakovich Kaganov

(1921–2019)

To the 100th birthday



This is the first part of the three-volume issue of the Journal “Low Temperature Physics” intended to commemorate the centennial birthday of Moisey Isaakovich Kaganov — a brilliant representative of the Kharkov theoretical physics school founded by L. D. Landau and further developed by his prominent disciples I. M. Lifshitz and A. I. Akhiezer.

For many years these constituents of the Kharkov school of physics were advancing through strenuous and yet mutually tolerant competition-cooperation in which Moisey Isaakovich performed his important function of a connecting link. The issues are timed to correspond to the official date of M. I. Kaganov’s birthday (August, 1921, Lubny) and the actual date (June, 1921, Kharkiv).

M. I. Kaganov was born in the family of I. Ya. Kaganov, a well-known university professor-philologist. That most likely predestined one of the brightest features of M. I. Kaganov’s generously gifted personality — the refined and

accurate style of his numerous articles and books, brilliant oral reports and speeches at seminars and conferences. In 1939 M. I. Kaganov entered the Physics and Mathematics Department of Kharkov State University but almost immediately was called up for military service in the Navy, where he served through all the years of WWII and was awarded the Great Patriotic War and Red Star Orders. After release in 1946, M. I. Kaganov came back to Kharkov and to the University, from which he graduated in 1949. During this post-war period, Kharkov University trained a constellation of outstanding theoretical physicist, Kaganov stood out among them.

Since 1949 to 1970 M. I. Kaganov worked in the Theoretical Department of UFTI (Ukrainian Physics & Engineering Institute, now Kharkov Physics & Engineering Institute) headed by I. M. Lifshitz, where he was in charge of the laboratory of electronic properties of metals.

Here he defended his Theses — “The Interaction of Charged Particles and Slow Waves in Anisotropic Dielectrics” (Candidate of Sciences, 1954) and “Some Problems of Kinetic Theory of Solids” (Doctor of Sciences in Physics and Mathematics, 1958). The Theses titles demonstrate a broad range of M. I. Kaganov’s scientific interest. The quantum theory of galvanomagnetic and acoustic effects in metals possessing, complex energy spectra of conduction electrons and nonspherical geometry of the Fermi surface. Together with I. M. Lifshitz and his disciples, M. I. Kaganov took part in the investigation which laid foundation of the present day theory of metals and developed the ideology of the theory of solids which is known as the «fermiology». The results of these investigation are summarized in the monograph «Electron Theory of Metals» by Ilia Lifshitz, Mark Azbel, and Moisey Kaganov, which has become a handbook for physicist involved in this area of solid state physics.

In the following years M. I. Kaganov, a professional theoretical physicist, contributed considerably almost to all aspects of present day physics of condensed matter: electron theory of metals, some areas of electrodynamics of continuous media, the problems related to various aspects of theory of phase transitions in electro- and magnetoactive media, the theory of low-temperature magnetism, acoustic and thermal properties of superfluid helium, the effect of conduction electrons on the mechanical and acoustic properties of metals.

Moisey Isaakovich Kaganov’s many-sided professional interest is reflected in these issues of the journal. The papers and reviews submitted present with equal attention the electron theory of metals and semiconductors, physics of magnetism and research on superfluid helium. In a considerable part of the articles, above aspects of physics are related with present-day problems of theoretical research on new compounds, structures and materials in solid state physics. We are pleased to mention here that the group of the whose submission form these issues includes several Kaganov’s former post-graduates and many of his former students.

M. I. Kaganov was a wonderful university lecturer, supervisor, and a preceptor for his postgraduates, always an indefatigable popularizer of physics. His famous book “Electrons, Phonons, Magnons” and the books written in co-authorship with I. M. Lifshitz (“Quasi-Particles: Ideas and Principles of Quantum Solid State Physics”) and V. Tsukernik (“The Nature of Magnetism”) go far beyond the scope of popular-scientific literature: up to now they admit starting researchers-theorists to various areas of solid state physics. These are complemented by about twenty reviews in the Journal “Uspekhi Fizicheskikh Nauk” and about a ten of booklets issued by the Znanie Publishers.

While working in the UFTI (1965–1970), M. I. Kaganov concurrently supervised the formation of a theoretical department at the Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of

Ukraine. Later he worked actively as a member of the Editorial Board and a contributing author for the Journal “Fizika Nizkikh Temperatur” started by the ILTPE in 1975.

The many years’ scientific and pedagogical work in universities also makes up an important part of M. I. Kaganov’s life in science. In the period of 1952–1970 Moisey Isaakovich was a professor at the Department of Statistical Physics and Thermodynamics at Kharkov State University (since 2014 this the Department of Theoretical Physics named after Academician I. M. Lifshitz), where he lectured on the courses “The Quantum Theory of Metals” and “Atomic and Nuclear Physics”. In 1970 M. I. Kaganov moved, along with I. M. Lifshitz, to Moscow, where they started to work in the Theoretical Department of the Institute for Physical Problems. Simultaneously, they did teaching at M. V. Lomonosov State University, Moscow, at the Chairs for Quantum Theory and Low Temperature Physics. M. I. Kaganov, a brilliant lecturer and a researcher of broad-range scientific interest, has educated several generations of disciples with tens of them successfully defended their candidate and doctoral dissertations.

For many years of the last century M. I. Kaganov was in active and close cooperation with physicists of Eastern Germany (former GDR) and Poland. His contributions had a profound effect on the progress of the theory of solids in these countries. In 1998 his scientific and pedagogical activities were noted by awarding the honorable title Doctor Honoris Causa of Wroclaw Technological University (Poland).

M. I. Kaganov was a well-educated and broad — minded person, a man of great erudition. And not only in science. He is remembered as a connoisseur of literature (especially poetry), theatre and arts. He had many-years’ friendly contacts with merited people in various spheres of his interest. He was fond of this world and eager to share generously its charms with his colleagues-scientists.

Moisey Isaakovich spent his final period of life in the USA, where he lived since 1994 and where he wrote and published a great cycle of his memoirs. Having endured the burden of the war and traversed a long laborious and creative path, M. I. Kaganov kept his clear mind, love, goodwill regard for people and sincere delight of life till his final day — August 31, 2019.

For everyone who happened to contact him, close or remote, young or elderly, he was Musik Kaganov — he always introduced himself this way and insisted on addressing him just this way. Musik was a holiday-like person generating festive impression on contacting him. We see him this way when we look at his photo applied to this writing.

*O. S. Kovalev
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