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(*b*. Baku, Russia, 22 January 1908; *d*. Moscow, U.S.S.R, 3 April 1968)

theoretical physics.

Landau's father was a well-known petroleum engineer who had worked int he Baku oil fields. His mother received a medical education in St. Petersburg, where she did scientific work in physiology and later worked as a physician. When Landau finished school at thirteen, he was already attracted to the exact sciences. His parents though him too too young to enter Baku University (now Kirov Azerbaydzhan State Universty), where he studied in the department of physics-mathematics adn chemistry. Although Landau did not continue his chemical education, he retained an interest in chemistry until his death.

In 1924 he transferred to the physics department of Leningrad University; three years later he published his first scientific work, on quantum mechanics. Also in 1927 he graduated from the university and became a graduate student at the Leningrad institute of Physics and Technology. In his work devoted to *Bremsstrahlung* Landau first introduced the quantity later known as the density matrix (1927).

In 1929 Landau visited Germany, Switzerland, Holland, England, Belgium, and Denmark. There he became acquainted with Hohr, Pauli, Ehrenfest, and W. Heisenberg. Most important for Landau was his work in Copenhagen where theoretical physicists from Europe had gathered around Bohr. His participation in Bohr's seminar played an improtant role in Landau's development as a theoretical physicist. In 1930 Landau together with R. Peierls investigated a number of subtle problems in quantum mechanics. In the same year Landau did fundamental work in the field of the theory of metals, showing that the degenerate electron gas possesses diamagnetic susceptibility (Landau diamagnetism).

In 1931 he returned to Leningrad and worked int he Institute of Physics adn Technology; in 1932 he transferred to Kharkov, where he became the scientific leader of the theoretical group of the newly created Ukrainian Institute of Physics adn Technology. At the same time he occupied the chair of theoretical physics at the Kharkov Institute of Mechanical Engineering, and from 1935 he occupied the chair of general physics at Kharkov University.

In 1934 he ws awarded the degree of Doctor of Physical and Mathematical Sciences without defending a dissertation, and in 1935 he received the title of professor. The foundation for his creation of a extensive Soviet school of theoretical physics ws laid at Kharkov.

Landau's scientific work during this period dealt with various problems in the physics of solid bodies, the theory of atomic collisions, nuclear physics, astrophysics, general questions of thermodynamics, quantum electrodynamics, the kinetic theory of gases, and the theory of chemical reactions. Especially noteworthy is his well-known work on the kinetic equation for the case of Coulomb interactions, the theory of ferromagnetic domain structure adn ferromagnetic resonance, the theory of the anti ferromagnetic state, the statistical theory of nuclei, and the widely known theory of second-order phase transitions.

In 1937 Landau became director of the section of theoretical physics of the Institute of Physical problems of the U.S.S.R. Academy of Sciences in Moscow, where he worked until the end of his life.

Landau's scientific work from 1937 to 1941 dealt especially with the cascade theory of electron showers adn the intermediate state of superconductors. The physics of elementary particles adn nuclear interactions began to occupy an ever greater place in his works. In 1941 he elaborated the basic features of the theory of the super fluidity of helium II. His work in the physics of combustion and the theory of explosions (1944–1945) is noteworthy, as is his research on the scattering of protons by protons and on the theory of protons by protons and on the theory of ionization losses of fast particles in a medium. In 1946 Landau developed the theory of electron plasma oscillations.

From 1947 to 1953 Landau considered various questions in electrodynamics, teh theory of viscosity of helium II, the new phenomenological theory of superconductivity and, the theory, of great importance in the physics of cosmic rays, of the multiple origin of particles in the collision of fast particles.

In 1954 Landau studied questions dealing with the principle of the quantum field theory. As a result of this work, in 1955 he and I. Y. Pomeranchuk obtained a significant argument suggesting that the perturbation series of quantum electrodynamics and the quantum field theory of strong interactions do not sum to a consistent solution.

From 1956 to 1958 Landau created a general theory of the so-called Fermi-liquid, to which liquid helium III and the electrons in metals are related. In 1957 he presented a new general law of modern physics, the law of CP conservation, to replace the law of the conservation of parity which appeared incorrect for weak interactions. In 1959 Landu advanced new principles of the structure of the theory of elementary particles. In a published article he noted a way to determine the basic properties of the so-called interaction amplitude of particles.

Landau's published textbooks for institutions of higher education and his monographs on theoretical physics are characterized by precision of exposition and richness of scientific material, combined with exceptional clarity and the presentation of profound physical ideas. His monographs on theoretical physics are widely known throughout the world. The first book of his course on theoretical physics, *Statisticheskaya fizika* ("Statistical Physics," 1938), was followed by *Mekhanika* ("Mechanics") and *Teoria polya* ("Field Theory")

In his last years Landau, together with E. M. Lifshits, continued to work on a course of theoretical physics. In 1948 a new book of this course appeared, Kvantovaya mekhanika ("Quantum Mechanics"), as well as a revised edition of *Teoria polya*. In 1951 he published a completely new work on statistical physics and, in 1953, *Mekhanika sploshnykh sred* ("The Theory of Elasticity"). A course of lectures on general physics, given by Landau in the Moscow Institute of Physics and Technology was published in 1949, followed in 1955 by a course of lectures in the theory of the atomic nucleus written with Y. A. Smorodinsky. Another volume in this series, *Elektrodinamika sploshnykh sred* ("Electrodynamics of Continuous Media"), appeared in 1957. The authors' continuing revisions of these works were tantamoung to the writing of a new book.

Landau created a very important scientific school. His students worked in the most varied field of theoretical physics and became distinguished scientists. Among his students were E. M. Lifshits, I. Y. Pomeranchuk, I. M. Lifshits, A. S. Kompaneyts, A. I. Akhiezer, V. B. Berestetsky, I. M. Shmushkevich, V. L. Ginzburg, A. B. Migdal, Y. A. Smorodinsky, I. M. Khalatnikov, A. A. Abricossov, and K. A. Ter-Martirosian.

Landau's scientifc achievements received wide recognition. He was elected to membership in the Academy of Sciences of the U.S.S.R. and was awarded the title of Hero of Socialist Labor. Landau received the State Prize of the U.S.S.R. three times, and in 1962 he was awarded the Lenin Prize.

International recognition was expressed by the award of the Nobel Prize in physics in 1962; he was also elected member of many foreign academies and societies. In 1951 he was chosen a member of many foreign academies and societies. In 1951 he was chosen a member of the Danish and, in 1956, the Netherlands academies of science. In 1959 he was elected a member of the British Physical Society and in 1960 of the Royal Society. In the same year he became a member of the U. S. National Academy of Sciences and the American Academy of Arts and Sciences and was awarded the F. London Prize (U.S.A.) for research in low-temperature physics and the Max planck Medal (West Germany).

A tragic accident cut short Landau's scientific work. In January 1962 he sustained severe injuries in an automobile accident and for several months lingered between life and death. Through remarkable efforts the life of this great physicist was prolonged for six years.

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