

Gerasim Matveevich Eliashberg (on his sixtieth birthday)

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The outstanding theoretical physicist, Doctor of Physicomathematical Sciences G. M. Eliashberg recently celebrated his sixtieth birthday.

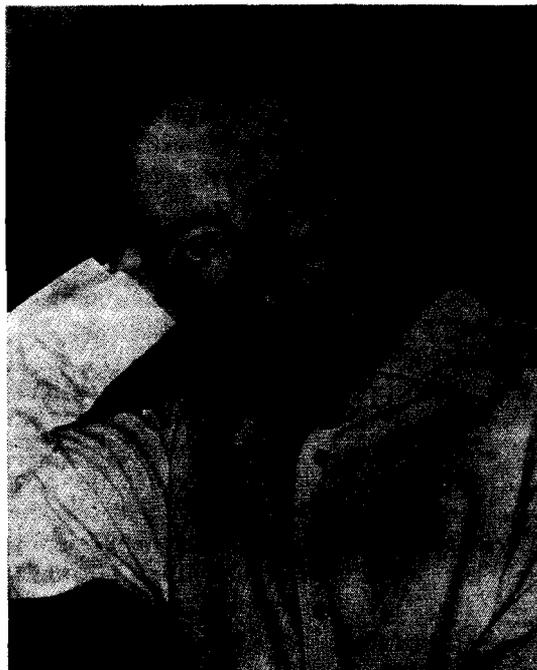
G. M. Eliashberg was born in Leningrad on July 26, 1930. In 1947 he enrolled in the physics department of Leningrad University. He graduated with honors in 1952, but had no opportunity to pursue his vocation in those difficult times and worked instead at the "Red Chemist" plant for the next five years. During that time G. M. Eliashberg published his first papers on theoretical physics that established his reputation.

In 1959 G. M. Eliashberg began graduate school and two years later became a junior research associate at the A. F. Ioffe Physicotechnical Institute in Leningrad. In 1960 he published two papers on superconductivity, in which he developed a theory of superconductivity that did not presuppose the weakness of electron-phonon interactions. In these papers, which quickly became classics, G. M. Eliashberg successfully constructed a theory of electron-phonon interaction in superconductors at finite temperatures. He applied the method of analytic continuation from imaginary frequencies to derive the famous Eliashberg equations for the superconducting order parameter. These equations, which brought Eliashberg worldwide acclaim, became the starting point of a multitude of studies and laid the foundations of the modern science of superconductivity. The solution of Eliashberg equations became a basic technique in superconductivity research into real materials. After the recent discovery of high-temperature superconductivity these equations have attracted even greater interest.

Another well-known paper of G. M. Eliashberg, published around the same time, generalized Landau's Fermi-liquid theory to finite temperatures. The methods developed in this paper became widely known and passed into general usage. G. M. Eliashberg explained the absence in ^3He of the specific "zero-sound" effect predicted by Landau and pointed to the range of temperatures and frequencies where this effect might be observed. Later, in 1965, "zero-sound" was indeed experimentally observed in that range.

In 1963 G. M. Eliashberg defended his candidate's dissertation. A year later he moved to Moscow. In 1965, after one year in the theoretical section of the Chernogolovka (Moscow province) branch of Institute of Physical Chemistry of the USSR Academy of Sciences, G. M. Eliashberg became a senior research associate at the L. D. Landau Institute of Theoretical Physics of the USSR Academy of Sciences, where he has worked to this day.

G. M. Eliashberg made a significant contribution to the physics of nonequilibrium superconductivity. The analytic continuation technique he developed in the mid-1960's allowed G. M. Eliashberg (together with L. P. Gor'kov) to develop a consistent kinetic theory of superconductors in external fields and derive the time-dependent generalization



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of the Ginzburg-Landau equations. One of the most striking predictions of this theory was superconductivity enhancement by a high-frequency field. These papers provided the impetus for wide-ranging experimental and theoretical investigations of nonequilibrium superconductivity. G. M. Eliashberg's papers of this period clearly exemplify his superior grasp of difficult analytic techniques combined with a remarkably precise physical statement of the problem.

In 1972 G. M. Eliashberg defended his doctoral dissertation and began lecturing at the theoretical physics department of the Moscow Physicotechnical Institute. G. M. Eliashberg is a marvelous lecturer and teacher. His lectures not only impart facts and ideas to the students, but, more importantly, they transmit a scientific culture, good manners, clarity of thought and other essential, timeless attributes. During his years at the Moscow Physicotechnical Institute G. M. Eliashberg supervised many candidate level dissertations.

G. M. Eliashberg authored important papers on the physics of metals. In 1962 he published a well-known paper on the properties of phonon spectra in metals and the related singularities in thermodynamic functions. Subsequently, in 1965, he developed with L. P. Gor'kov a theory of small metallic particles. By describing an ensemble of such particles with the so-called Dyson distribution, Eliashberg and Gor'kov deduced a number of interesting physical results amenable to experimental verification. Some of these results anticipated modern mesoscopic science—the study of quan-

tum states of disordered metals.

G. M. Eliashberg quickly joined the fray in new high-temperature superconductors. In addition to valuable original papers, he has recently delivered a number of review lectures that have attracted a wide audience. As always, the style of these investigations emphasized G. M. Eliashberg's abiding scientific culture, originality, and clarity of thought.

G. M. Eliashberg's achievements in Soviet science received official recognition: in 1970 he was awarded a jubilee medal celebrating the centenary of Lenin's birth. G. M. Eliashberg was always an active participant in international conferences that took place on Soviet territory. However, times were such that he was rarely permitted to travel abroad (he attended conferences in Poland and Hungary in 1967, but only in 1988 was he allowed to travel to the U.S.). His international reputation based on superconductivity research endowed G. M. Eliashberg with such fame and status,

that when he finally appeared in the U. S. in 1988 nobody could believe that this young, alert, and active man had authored papers that became classic thirty years earlier.

G. M. Eliashberg occupies a special place in the Landau Institute and all of Soviet theoretical physics. He is a very sensitive, deeply intellectual, highly educated man who practically radiates culture. A profound thinker, he pursued research enthusiastically and honestly, with no room for one-upmanship. Everything that G. M. Eliashberg does in physics bears the mark of his personal charm. Contact with G. M. Eliashberg is a constant source of benefit, pleasure, and joy.

We wish Gerasim Matveevich good health and further creative success.

Translated by A. Zaslavsky