

## In memory of Vladimir Markovich Eleonskiĭ

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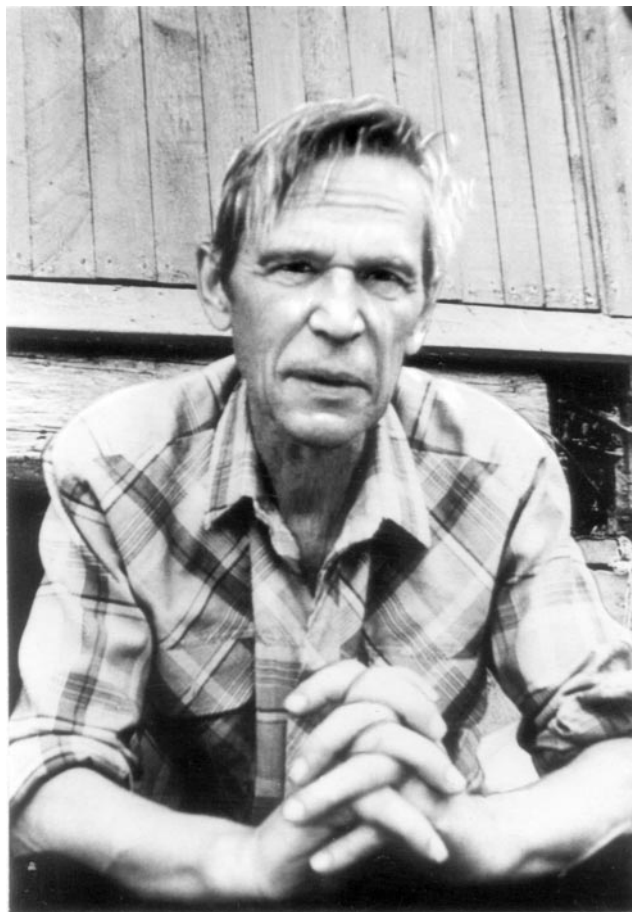
Vladimir Markovich Eleonskiĭ, Professor at the Moscow Physico-Technical Institute (now Moscow Institute of Physics and Technology), brilliant physics theoretician, DSc in physics and mathematics, and Head of the Theoretical Physics Laboratory of the F V Lukin Research Institute of Physics Problems, past away on December 9, 2002 after a prolonged serious illness.

Eleonskiĭ was born on April 30, 1931 in Rzhev, into a family of a military officer. He spent his school years in Sverdlovsk (now Ekaterinburg), where in 1949 he entered the recently opened Physico-Technical Department of the Urals Polytechnic Institute. His research work started virtually from the first days of his enrollment in the Physics Department. Eleonskiĭ, still only a freshman student, read a paper to a student research conference in which he showed that the so-called theory of ‘chemical resonance’ of Linus Pauling, which was at the time cursed by ideological ‘fighters against idealism’, was merely a variant of the widely known variational methods of quantum mechanics.

In 1955 he began working at the chair of theoretical physics in his department, started reading lectures to students on theoretical physics, and went vigorously into research. Together with his science adviser P S Zyryanov, he published nearly ten papers on selected aspects of the theory of many-particle interactions in *Zh. Eksp. Teor. Fiz.* [*Soviet Physics – JETP*] and *Fiz. Met. Metalloved.* [*Physics of Metals and Metallography*] from 1956 to 1958. An early paper by P S Zyryanov and V M Eleonskiĭ, “On linearization of the Hartree equation”, published in *Zh. Eksp. Teor. Fiz.* [*Soviet Physics – JETP*] in 1956, considered for the first time the ‘random phase approximation’ which later became widely used in the many-particle theory. Eleonskiĭ’s PhD thesis “On the theory of collective motions in quantum systems” was successfully defended in September 1959.

Beginning in 1961, Eleonskiĭ took a very active part in the work of the ‘Winter Schools of Physics Theorists’, widely known as ‘Kourovki’, where professional and human bonds were sealed among physicists arriving from different cities of the country. Close encounters, and then close friendships with well-known physics theorists S V Vonsovskiĭ, G V Skrotskiĭ, and V P Silin played an important role in broadening Eleonskiĭ’s interests as both scientist and human being. We need to put special emphasis on the mutual attraction and close friendship with the legendary ‘Bison’ — N V Timofeev-Resovskiĭ, who greatly influenced the personality of Eleonskiĭ; this friendship lasted until the last days of the latter.

In 1964 Eleonskiĭ and his family moved to Zelenograd near Moscow where he started working in the Theoretical Department of the F V Lukin Research Institute of Physics Problems, where he remained for 38 years until the end of his



Vladimir Markovich Eleonskiĭ  
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life. He immediately took up research in a new area — the study of nonlinear processes in semiconductor and magnetic structures — and in 1977 presented and defended his DSc thesis “The structure of electromagnetic waves in nonlinear media”.

Eleonskiĭ was among the first scientists who perceived the beauty and complexity of mathematical problems that arise in the physics of magnetic phenomena; he also understood their importance for nonlinear physics. By the beginning of the 1970s, the soliton solutions of the Landau – Lifshitz equations were studied only for the simplest variant of these equations. Eleonskiĭ and his students proved the integrability of a more general model, and found new types of solitons for a non-integrable model; these solitons could be described as bound clusters of domain walls and were absent in the integrable case.

The scope of interests of Eleonskiĭ widened constantly. It covered such fields of theoretical and mathematical physics as nonlinear optics, nonlinear phenomena in semiconductors and magnetic systems, problems related to self-localization

and self-organization, and mathematical problems of the theory of dynamic systems.

A salient feature of Eleonskiĭ's papers was their exceptional physical clarity, impeccable mathematical rigor in formulating a problem, and exceptional simplicity in selecting the methods of solution. He was publishing actively in *Zh. Eksp. Teor. Fiz.* [*Soviet Physics–JETP*], *Teor. Mat. Fiz.* [*Theoretical and Mathematical Physics*], and *Dokl. Akad. Nauk SSSR* [*Soviet Physics–Doklady*, later *Doklady Physics*], as well as and in other publications in the USSR (later Russia) and abroad. The list of his research publications runs to 120 papers.

For many years and until his last days, Vladimir Markovich Eleonskiĭ taught to students a nontrivial course on nonlinear physics of semiconductors and magnets at the chair of microelectronics of the Moscow Physico-Technical Institute (at its Zelenograd campus). In February 2002, at the 29th International School of Physics Theorists ‘Kourovka-2002’, he delivered his last lecture “Simple classical and quantum problems (the harmonic oscillator problem, Kepler’s problem, etc.) from the standpoint of ‘fractal’ dynamics” where he again demonstrated his theoretical and pedagogical potential.

Eleonskiĭ had a very special attitude to science and the surrounding world. He perceived the problems on which he worked as a natural part of the world, and their beauty for him was part of the beauty of nature. It is no surprise that his last papers were devoted to analyzing nonlinear equations that describe two-dimensional periodic and quasi-periodic field distributions whose solutions he called ‘patterns’.

It is important to mention the huge contribution that Eleonskiĭ made as a scientist and human being to the formation of a kind of ‘solitons-nonlinear-magnetic’ community which covered Moscow and the Volga area, the near-Moscow region, Ukraine, and the Urals. This community of like-minded people considered the role played by Eleonskiĭ in their scientific and human progress as invaluable. Among them we find Vladimir Markovich’s students and also people who never worked with him directly but responded to his ideas and were influenced by the charm of his unique personality.

Serious illness and untimely death stopped Vladimir Markovich while he was full of creative potential and planned further work. We will all miss him very much. He will survive in our memory as an example of a unique, highly talented scientist, and at the same time a simple and modest man.

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