

In memory of Iosif Iosifovich Levintov

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Professor Iosif Iosifovich Levintov, DSc in physics and mathematics, a brilliant scientist, expert in polarization phenomena in nuclear physics and elementary particle physics, died on August 12, 2001 after a long illness.

I I Levintov was born on 11 July 1916 in Odessa. His life followed a checkered path. Before enrolling in Moscow State University (MSU) in 1934, he worked as laboratory technician at the L Ya Karpov Physico-Chemical Institute. He graduated from MSU in 1940 and was mobilized into the Red Army by the end of the year; he was fighting against the German invasion at the frontline, on the Western and South-Western fronts. In 1942 he was wounded and retired from active service. For his courage at the front, he was awarded “The Fatherland (Otechestvennaya) War” Order IIInd class and a number of medals. At the end of 1942 he started working at the Institute of Chemical Physics of the USSR Academy of Sciences, as Junior and then Senior Scientist, and as Research Team Leader until his transfer to the Institute for Theoretical and Experimental Physics (ITEP) in 1956. In 1947 I I Levintov submitted and defended his PhD thesis (physics and mathematics), and in 1957 his DSc thesis. The theses summarized Levintov’s results obtained in studying the nature of spin effects in strong interactions; it was a pioneering work in the USSR. Levintov carried out a systematic experimental program and interpreted the results obtained. The Keller–Levintov theorem describing the characteristic features of the spin-orbital interaction is widely known.

I I Levintov’s work at the Institute of Chemical Physics determined the main thrust of his research for several decades and manifested his credentials as a physicist who combined his experimental work with profound and nontrivial theoretical analysis of phenomena of interest.

Having transferred to the Institute for Theoretical and Experimental Physics, I I Levintov continued his study of polarization effects in direct reactions and, beginning in 1963, became head of the Cyclotron Laboratory of ITEP. His interests were largely changing at this time to studying polarization effects at high energies. He organized a team of physicists who pioneered measurements of polarization in elastic proton-proton scattering at energies of several GeV on the Laboratory of High Energy accelerator at the Joint Institute of Nuclear Research (JINR) at Dubna. The nonzero results of this experiment indicated the significant role of spin effects at high energies and stimulated a series of new experiments in the USSR and abroad.

In 1968 I I Levintov developed the theoretical foundation for a program of studying polarization parameters in the channels of the elastic $\pi^{\pm}p$ -, $K^{\pm}p$ -, pp -scattering at 40 GeV/c.



Iosif Iosifovich Levintov
(11.07.1916–12.08.2001)

A series of successful experiments of the IHEP–JINR–ITEP–Saclay (France) international cooperation on the Serpukhov accelerator obtained unique data which made possible direct reconstruction of amplitudes of the pion-nucleon scattering and verification of several important predictions of the Regge phenomenology. I I Levintov made a significant contribution to the theoretical understanding of the results collected.

Although spin physics was the main field of Levintov’s research, his work was not limited to this topic alone. I I Levintov possessed the gift of choosing the most exciting and promising problems in nuclear physics and elementary particle physics. For instance, he suggested measuring the A-dependence of the deuteron yield in the interaction of fast protons with nuclei, which proved to be nontrivial. I I Levintov initiated a series of projects on the excitation of nuclear energy levels by high-energy hadrons; very unexpected physical results were obtained. He led work on the study of the mechanism of excitation of the lower levels

of the ^{12}C , ^{16}O and ^{40}Ca nuclei by intermediate-energy pions and protons. An original technique was employed to single out the final states of the excited nuclei by recording the characteristic gamma radiation using a Ge detector ('hadron-gamma spectroscopy'). One of the more interesting results of this study was the conclusion that the excitation of the lower levels of nuclei mostly occurs in the scattering of hadrons by alpha-clusters of the nucleus.

In the 1980s Levintov's Laboratory of Polarization Research built, on Levintov's initiative, a large-scale experimental facility SPIN with a polarized proton target which made it possible to measure polarization parameters in the processes of elastic and quasi-two-particle pion-nucleon interaction in the resonance region. In parallel with this, I I Levintov worked almost without interruption from mid-1970s on the problem of dynamic interpretation of spin effects at high energies that went beyond the framework of a phenomenological description. He developed several models of spin effects, ranging from the dynamic amplitude model with spin rotation to the dynamic model of soft binary processes in which it was possible, for the first time, to give a qualitative description of their spin structure in terms of the modern concept of the confinement mechanism when the QCD string breaking.

I I Levintov was one of the founders of the studies of spin effects in the USSR. His ideas were implemented on accelerators of the Laboratory of High Energy of the JINR in Dubna, of the Institute for High Energy Physics (IHEP) in Protvino, and the ITEP. He assembled and trained a highly creative team that includes a number of well known Russian physicists. I I Levintov as a scientist was fully devoted to physics and continued his research to his last days.

His outstanding organizational talent, his impressive achievements, courage and talent in experimentation and theoretical work earned him respect and popularity in the scientific community.

We will keep the memory of I I Levintov in our hearts.

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