
OBITUARY

Karen Avetovich Ter-Martirosyan

PACS numbers : 01.65.+g

DOI: 10.1134/S1063778806120210



Karen Avetovich Ter-Martirosyan, an outstanding scientist and a remarkable teacher, a corresponding member of the Russian Academy of Sciences, passed away on November 19, 2005. A worldwide renowned theoretical physicist in the realms of nuclear and particle physics, he had worked over 50 years until his last days at the Institute of Theoretical and Experimental Physics (ITEP, Moscow).

Ter-Martirosyan was born in Tbilisi on September 28, 1928. He graduated from Tbilisi State University in 1943 and became a postgraduate student at the Leningrad Institute for Physics and Technology in 1945, where Yakov Il'ich Frenkel, one of the founding fathers of the Soviet school of theoretical physics, was his teacher and mentor. Upon writing his candidate's dissertation under Frenkel's supervision and obtaining his candidate's degree in 1949, Ter-Martirosyan joined the theoretical department of that institute. His fruitful cooperation with L.D. Landau began in that period and continued later in Moscow. In 1955, Ter-Martirosyan moved to the ITEP theoretical department headed by I.Ya. Pomeranchuk. There, he

obtained outstanding results, paved new lines of investigations, created the laboratory of hadron physics, and founded the Particle Physics Department of the Moscow Institute for Physics and Technology, where his unique scientific school arose.

The achievements of Ter-Martirosyan covered a wide range of problems in nuclear science—from quantum mechanics to modern Grand Unified theories. Frequently, he chose problems that nobody had dared to address before and, as a rule, found accurate, useful, and nonstandard solutions. In 1952, Ter-Martirosyan developed a theory of the Coulomb excitation of nuclei, and this theory served as a basis for discovering deviations from a spherical shape for some heavy nuclei. In 1968, he was awarded a State Prize for this study.

In the period between 1952 and 1954, Ter-Martirosyan solved the three-body quantum-mechanical problem for the case of short-range potentials (Skornyakov–Ter-Martirosyan equation, which was later generalized by L.D. Faddeev). The parquet-equation method developed by Ter-Martirosyan, together with I.T. Dyatlov and V.V. Sudakov, for summing planar graphs was highly appreciated by Landau. This method, which seemed to be of a purely academic interest in 1957, subsequently found wide applications in analyzing the scalar sector of electroweak theory.

The achievements of Ter-Martirosyan in the theory of strong interactions at high energies are remarkable. In particular, he developed, together with V.N. Gribov and Pomeranchuk, the theory of branch points in the plane of complex angular momentum. Also, he discovered processes that have multi-Regge kinematics, described theoretically growing cross sections, and constructed the theory of the critical and the supercritical Pomeron. In that series of studies, a profound theoretical analysis comes along with a description of the most up-to-date experimental data torrentially flowing at that time from new powerful accelerators. Ter-Martirosyan was among the first who realized the role of computers as a tool of theoretical physics at the present stage of its development. A theoretical description of the entire body of the most important binary hadron processes

at high energies had been obtained by the early 1970s. The self-consistency of the theory required a simultaneous description of multiparticle processes inclusive, and Ter-Martirosyan developed a theory of the multiplicity distribution of hadrons at high energies. A realistic theory of particle production in hadron–hadron and hadron–nucleus collisions at high energies was developed on the basis of the model of quark–gluon strings, which was proposed by Ter-Martirosyan and A.B. Kaidalov. This theory made it possible to describe precisely all experimental data available at that time for the inclusive spectra of product hadrons and has remained to date the main phenomenological theory of hadron interactions at high energies, naturally fitting in the range of ideas of quantum chromodynamics.

Ter-Martirosyan contributed greatly to intensifying international relations of Soviet and Russian scientists. On his initiative, the theoretical department of ITEP began cooperation with laboratories of Orsay and Oxford; also, he actively participated in organizing international schools in physics in Nor-Amberd and Yerevan in the 1960s and often delivered lectures at the ITEP schools in physics and at other international schools.

In 1999, Ter-Martirosyan was awarded a Pomeranchuk Prize for a fundamental contribution to quantum mechanics and quantum field theory. In 2000, he was elected a corresponding member in the Russian Academy of Sciences.

Ter-Martirosyan was always open to new ideas in particle physics. In the last years, he was deeply involved in studying supersymmetric theories and the properties of hadrons containing heavy quarks. His last report at the ITEP theoretical seminar in 2005 was devoted to the properties of neutrinos.

Ter-Martirosyan contributed greatly to the development of science in this country. He was a talented teacher and, for almost four decades, headed

a department at the Moscow Institute for Physics and Technology, where he gave lectures on quantum field theory. This course of lectures included all of the most recent advances of contemporary quantum physics, and his students immediately appeared to be at the front edge of science. Together with M.B. Voloshin, Ter-Martirosyan published in 1981 the monograph *Gauge Theory of Particle Interaction*, which has thus far remained one of the best textbooks in quantum field theory. He enjoyed teaching, and students loved him despite his exactingness and strictness. He was always affable, considerate, and open to discussing any problems, both of scientific and human character. Being a stranger to scheming and hypocrisy and always ready to struggle for justice, Ter-Martirosyan tried to instill these qualities into his disciples. Until his last days, he continued supervising the work of students and postgraduate students at the Moscow Institute for Physics and Technology and ITEP, devoting a great deal of his time to this.

The creation of a brilliant school of theoretical physics was an outstanding result of the many years of Ter-Martirosyan's pedagogical activities. His disciples include A.A. Anselm, Gribov, Yu.A. Simonov, Kaidalov, A.A. Migdal, A.M. Polyakov, and A.B. Zamolodchikov, who, in turn, brought up many famous physicists. Theorists who were under his tutelage work in the best research centers worldwide. They are to remember Ter-Martirosyan's enthusiasm and passion for science to which he devoted all his life and to transmit them to the new generation.

Sincerity was a remarkable feature of Ter-Martirosyan. He simply did not understand how one could avoid telling the truth openly and without a fear of consequences. He wanted to see goodness and truth everywhere. And as an approachable, kind, and sincere personality, he will forever remain in our memory and hearts.

Disciples and Colleagues