

In memory of Karen Avetovich Ter-Martirosyan

DOI: 10.1070/PU2006v049n08ABEH006128

The Russian scientific community has suffered a sad loss: Karen Avetovich Ter-Martirosyan, an outstanding theoretical physicist, Corresponding Member of the Russian Academy of Sciences (RAS), died on 19 November 2005. This is a loss of one of stars in the brilliant constellation dating back to the golden era of Soviet physics: a disciple of Ya I Frenkel' and L D Landau, he was one of the creators of the theory of strong interactions at high energies and founded a unique school of theoretical physics.

Ter-Martirosyan was born on September 28, 1922 in Tbilisi. In 1943, he graduated from Tbilisi State University and in 1945 started a postgraduate course at the Leningrad Physical-Technical Institute (LFTI). There in 1949 he defended his thesis for Candidate of Physicomathematical Sciences supervised by Yakov Il'ich Frenkel', and started working at the Theoretical Department of LFTI. Even at the start of his budding career in research, Ter-Martirosyan was able to obtain in three years of work at LFTI outstanding results in nuclear physics. In 1952, he constructed a theory of the Coulomb excitation of atomic nuclei, on the basis of which nonsphericity in a number of heavy nuclei was discovered experimentally. In 1968, this work was awarded the State Prize. In 1952–1954, he solved the quantum-mechanical three-body problem for zero-radius forces. The equation he derived (it was generalized several years later by L D Faddeev to finite-radius potentials) is known in the world literature as the Skornyakov – Ter-Martirosyan equation.

Ter-Martirosyan had a new surge in his research career in 1955 when he transferred to the Institute of Theoretical and Experimental Physics (ITEP) in Moscow, where he submitted and defended his doctoral dissertation in 1957. Influenced by Landau and I Ya Pomeranchuk, his favored research areas at ITEP shifted towards the field theory and elementary particle physics.

Together with I T Dyatlov and V V Sudakov, Ter-Martirosyan solved the set of 'parquet' equations of quantum electrodynamics — the problem that Landau regarded as insolvable. The best known are his classical results in the theory of strong interactions at high energies. In collaboration with V N Gribov and Pomeranchuk, he developed the theory of bifurcation points in the plane of complex angular momentum, studied processes with multi-Reggeon kinematics, gave a theoretical description of cross-section growth, and built the theory of the critical and supercritical pomeron. A profound theoretical analysis was combined in this series of papers with a quantitative description of the totality of experimental data — obtained at the new accelerators at Brookhaven, Serpukhov, and CERN — available at the time. Later on, he constructed a theory of multiplicity distribution of hadrons at high energies. It



Karen Avetovich Ter-Martirosyan
(28.09.1922 – 19.11.2005)

formed the basis for elaborating the theory of particle creation in hadron–hadron and hadron–nucleus collisions at high energies. This theory survives as the main phenomenological approach to describing hadron interactions at high energies, merging smoothly with the range of ideas of quantum chromodynamics. In 1999, Ter-Martirosyan was awarded the I Ya Pomeranchuk Prize of the Russian Academy of Sciences “for his fundamental contribution to quantum mechanics and quantum field theory”. In 2000, he was elected Corresponding Member of the RAS.

Ter-Martirosyan was always very special in being wonderfully open to new ideas in elementary particle physics. He invariably worked at the forefront of theoretical physics, and his youthful enthusiasm was infectious to his younger colleagues.

Pedagogical activity occupied a huge place in his life. He founded at ITEP the base Elementary Particle Physics Chair of the Moscow Institute of Physics and Technology (MFTI) and headed it for many years. He helped to train dozens of young physicists who became experts not only in nuclear and elementary particle physics but in other fields as well. From the time the chair was established, Ter-Martirosyan gave lectures to students in quantum electrodynamics, quantum field theory, and elementary particle theory. On the foundation formed by these sets of lectures, he and M B Voloshin

published in 1981 a monograph *Gauge Theory of Interaction of Elementary Particles*. In the 1960s he was one of the creators of the famous Nor-Amberd physics schools. Later he actively took part in organizing almost every ITEP physics school; he actively participated in their work until his very last days.

Many years of teaching plus his creative personality produced a unique Ter-Martirosyan school of theoretical physics. Among his pupils we find brilliant scientists who made Soviet and Russian physics famous, like A A Ansel'm, V N Gribov, A B Zamolodchikov, Ya I Kogan, A A Migdal, A M Polyakov, and many others. Ter-Martirosyan went on advising students and postgraduates at MFTI and ITEP until his last days, devoting a considerable fraction of his time to this activity. The scientific school at ITEP, proudly named after Ter-Martirosyan, continues to advance the ideas he introduced.

His unselfish service to science made him a role model, an example for young generations to follow, not only in his capacity as an important scientist but also as a brilliant personality. Ter-Martirosyan was a deeply sincere man of highest principles both in science and in life. He told the truth as he understood it under any circumstances, at any time, and to anyone, and it was incomprehensible to him how anyone could play the hypocrite to comply with a situation. He made mistakes, of course, but these were sincere mistakes 'straight from the heart'. He was loved by many, and they often regarded themselves as morally indebted to him. Karen Avetovich Ter-Martirosyan is no more and this is an irreplaceable loss to all of us and to physics in Russia.

*Yu G Abov, A F Andreev, M I Vysotskii,
M V Danilov, I M Dremin, B L Ioffe,
A B Kaidalov, O V Kancheli, L B Okun',
Yu A Simonov, A N Skrinsky, B Yu Sharkov*