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Karen Avetovich Ter-Martirosyan (on his eightieth birthday)

Karen Avetovich Ter-Martirosyan, outstanding physicisttheoretician, corresponding member of the Russian Academy of Sciences, celebrated his 80th Anniversary on September 28, 2002.

Karen Avetovich was born in Tbilisi in 1922. He graduated from the Tbilisi State University in 1943 and, after two years of teaching at the Chair of Physics of the Tbilisi Railroad Institute, started as the postgraduate at the Leningrad Physico-Technical Institute (LPTI). Under the supervision of Yakov Il'ich Frenkel he submitted and defended his PhD thesis in 1949 and took the position at the Theory Department of LPTI. In 1955 Karen Avetovich joined the Institute for Theoretical and Experimental Physics (ITEP) in Moscow where he defended his DSc thesis in 1957. He created the Laboratory of Hadron Physics and organized the Chair of Elementary Particle Physics of the Moscow Institute for Physics and Technology (MIPT); he headed this Chair for many years. In 2000 Karen Avetovich was elected corresponding member of the Russian Academy of Sciences to the Division of Nuclear Physics.

When listing the most important achievements of Karen Avetovich in physics, one cannot but marvel at the broad span of his interests. He obtained important results in various fields of particle physics: from classical nuclear physics and quantum mechanics to super-modern Grand Unification theories.

In 1952 he developed a theory of the Coulomb excitation of atomic nuclei. The theory proved instrumental for the experimental discovery of nonsphericity of a number of heavy nuclei. In 1968 he was awarded the State Prize for his work. Between 1952 and 1954 Karen Avetovich solved the quantum mechanical three body problem for a zero-range potential (the Skornyakov–Ter-Martirosyan equation which was later generalized by L D Faddeev for a finite-range potential). His results of 1957 on the summation of 'parquet' diagrams of quantum field theory proved later to be quite useful in the standard model of electroweak interactions.

The results obtained by Karen Avetovich in the theory of high-energy strong interactions are classical: the development, together with V N Gribov and I Ya Pomeranchuk, of the theory of branching points in the complex angular momentum plane; the discovery of processes in which kinematics imposes multi-reggeon exchange. Together with his disciples he gave a theoretical description of cross sections increasing with energy and suggested the theory of the critical and supercritical pomeron. A profound theoretical analysis is combined in this series of papers with a quantitative description of the latest experimental data, of which there was a deluge at that time, owing to the arrival of the new powerful accelerators. Karen Avetovich was one of the first to recognize the role of the computer as an essential tool in the



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theoretical hadron physics. This allowed him to describe, by the beginning of 1970s, the entire set of the most important two-particle high energy hadron processes. The self-consistency of the theory required that binary processes cannot be analysed separately, but only together with multiparticle processes. Karen Avetovich described the multiplicity distribution of hadron events at high energies and proposed a model of production and decay of quark-gluon jets. This model was a basis for developing a realistic theory of particle production in high energy hadron-hadron and hadronnuclear collisions. The theory made it possible to describe with high precision all the experimental data that were available at the moment. It still remains the main approach to describing hadron interactions at high energies; it naturally merges with ideas of Quantum Chromodynamics.

Karen Avetovich is special in his awe-inspiring openness to new ideas in elementary particle physics — provided they concern real physical phenomena. Always working at the forefront of theoretical physics, Karen Avetovich is always a source of inspiration for his younger colleagues.

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Teaching is a huge part of Karen Avetovich's life. For 35 years he was the head of the Elementary Particles Physics Chair at MIPT. Hundreds of young physicists passed through his hands and grew to be experts not only in nuclear physics and elementary particle physics but in other fields as well. K A Ter-Martirosyan delivered lecture courses on quantum mechanics and quantum field theory from the moment this Chair was established. Together with M B Voloshin, he published a monograph based on these lectures, *Gauge Theory of Elementary Particles Interactions*, which remains one of the best textbooks on quantum field theory.

Many years of Karen Avetovich Ter-Martirosyan's heroic teaching activities and the brilliance of his creative personality resulted in the maturation of a unique school of theoretical physics. Even now Karen Avetovich continues to devote his time and his sole to supervising the work of students and postgraduates of MIPT and ITEP. Always demanding so much of himself, Karen Avetovich is invariably attentive to people, striving for a profound understanding of not only their fates in science but of their problems and of their lives as well.

Karen Avetovich personifies a knight devoting his life to science and became a role model to the new generation of young scientists. In 1999 K A Ter-Martirosyan received the I Ya Pomeranchuk Prize "For a pivotal contribution to quantum mechanics and quantum field theory".

Colleagues, friends and disciples congratulate Karen Avetovich on his jubilee year and wish him much health, longevity and success in all aspects of his multifaceted activities.

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