



Prof. Rudolf Muradyan

Professor



Most important awards, prizes and academies

Lenin Prize for Physics, 1988; National Academy of Sciences of Armenia, Yerevan (1986); Pontificia Academia Scientiarum (1994).

Summary of scientific research

Rudolf Muradyan was educated at Moscow University and received his doctoral degree from the Joint Institute for Nuclear Research, Dubna. His work has covered a wide range of topics in elementary particle physics, mathematical physics, and cosmology. For discovering the Dimensional Quark Counting Rules he shared the 1988 Lenin Prize for Physics. The main results of Prof. Muradian's research can be summarized as follows: 1) Description of bound states and scattering amplitudes in the framework of Quantum Field Theory. 2) Construction of the Mandelstam double spectral function for 6th order diagram using the analytical properties of partial wave amplitudes in the complex angular momentum plane. 3) Investigation of the three nucleon forces in light nuclei in the framework of Quantum Chromodynamics. 4) Exact solution of the random walk problem on a sphere and in the Lobachevsky space. 5) Direct method of constructing irreducible representations for finite rotation groups - tetrahedral, octahedral, and icosahedral - based on the extraction of roots from unit matrices in a definite direction. 6) He is one of the authors of the Dimensional Quark Counting Rules for exclusive processes. This formula provides

direct information about the composite quark structure of matter and has a wide application in modern particle and nuclear physics. 7) An important contribution was made by Prof. Muradian to the solution of the old and most difficult problem of cosmogony - the problem of the origin of the rotation of planets, stars and galaxies. 8) By means of Mathematica, the computer algebra system, the package Diana was designed and implemented for making automatic and quick dimensional analysis of a broad range of problems in physics, engineering, and economics.

Main publications

Muradian, R., Solution of the "random walk" problem in the space with constant curvature, *Teoreticheskaya i Matematicheskaya Fizika*, 2, pp. 328-32 (1970); Matveev, V., Muradian, R. and Tavkhelidze, A., Automodelity in strong interactions, *Lettere al Nuovo Cimento*, 5, pp. 907-12 (1972); Matveev, V., Muradian, R. and Tavkhelidze, A., Automodellism in the large-angle elastic scattering and structure of hadrons, *Lettere al Nuovo Cimento*, 7, pp. 719-23 (1973); Matveev, V., Muradian, R. and Tavkhelidze, A., Automodelity in strong interactions, *Teoreticheskaya i Matematicheskaya Fizika*, 15, pp. 332-8 (1973); Muradian, R., On the origin of galaxies rotation in the Ambartsumian cosmogony, *Astrofizika*, 11, pp. 237-48 (1975); Muradian, R., Cosmic numbers and rotation of the Metagalaxy, *Astrofizika*, 13, pp. 63-7 (1977); Muradian, R., The origin of the magnetic fields and superdense cosmogony, *Astrofizika*, 14, pp. 439-46 (1978); Muradian, R., The primeval hadron: origin of stars, galaxies and astronomical universe, *Astrophysics and Space Science*, 69, pp. 325-37 (1980); Muradian, R., On the discrete subgroups of the three dimensional rotation group, *Teoreticheskaya i Matematicheskaya Fizika*, 46, pp. 335-47 (1981); Muradian, R., *Nuclear forces and QCD*, Izvestiya Akademii Nauk Armyanskoy SSR, Seriya Fizika, 16, pp. 252-61 (1981); Muradian, R., *On the rotation of astronomical Universe*, Preprint, Yerevan Physics Institute, Yerevan, YePI-636(26) (1983), Muradian, R., *The primeaval hadron: origin of rotation and magnetic fields in the Universe*, Preprint, Yerevan Physics Institute, Yerevan, YePI-701(16) (1984); Muradian, R., 'Cosmological constant and rotation of the Universe', *Astrofizika*, 21, pp. 396-8 (1984); Muradian, R., 'The new form of the Mendeleev table', *Armyanskij Khimicheskij Zhurnal*, 43, pp. 478-81 (1990); Muradian, R., *Regge in the sky: origin of the cosmic rotation*, Preprint, ICTP, Trieste, IC/94/143 (1994); Muradian, R., *Flare stars and Pascal distribution*, Preprint, ICTP, Trieste, IC/94/175 (1994); Muradian, R. and Santana, A., Ilopf structure in Nambu-Zie n-algebras, *Theoretical and Mathematical Physics*, 114, pp. 67-72 (1998).