Full Name: Ashot Sergei Gevorkyan
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Position Professor, Leading Researcher,

Head of scientific direction Modeling of Multiscale Physical-Chemical Processes

Member of editorial board of **Journal of Computational Science (Elsevier)** 2010-2017
http://www.journals.elsevier.com/journal-of-computational-science/editorial-board/

Member of Armenian Mathematical Union

Research Interest

Foundations of quantum physics and related to its problems of mathematical physics, multichannel classical and quantum scattering in three and few body systems, classical non-integrability and quantum chaos, stochastic quantum mechanics, quantum thermodynamics, exactly constructed models of quantum mechanics with random environment, quantum vacuum and its properties under influence of external fields, stochastic electrodynamics, classical and quantum three-body problem, disordered classical and quantum 3D spin system far from an equilibrium, method of functional integral, stochastic diff. equation, partial and ordinary diff. equations, curved geometry, simulation of a large system of algebraic equations, quantum computation, elaboration of high-performance parallel algorithms for simulation of different quantum problems etc.

Education

Bachelor, Magistracy Yerevan State University PhD Leningrad State University (Institute of Physics, Theoretical Department of A. Fock (1980-1983)),

Titles, Degree

Doctor of physical and mathematical sciences, 2000 St. Petersburg State University (Leningrad State University), Theoretical Department of A. Fock

Professional Experience

1983-1987 Junior research assistant, Lab of Theoretical Physics, Yerevan Physics Institute

1987-1992 Senior research fellow, Institute of Chemical Physics, NAS of Armenia

1992-1995 Leading research fellow, Institute of Applied Problem of Physics, NAS of Armenia

1995-2000 Head of Lab. of modeling of quantum systems & processes, (IHPCDB, St. Petersburg, Russia)

2000 Leading researcher, Institute for Informatics and Automation Problems, NAS of Armenia

2010 Leading researcher, Institute of Chemical Physics, NAS of Armenia

Research Grants

1) INTAS- Nr. 03-51-4000, Title: Quantum Chaos and Tunnelling in Chemical Reactions (team leader of Former Soviet Union)
2) ISTC project A-823, Development of Armenian-Georgian Grid Infrastructure and Applications in the Fields of High Energy Physics, Astrophysics and Quantum Physics (Theory Group Leader),
3) 2005 -2006 - ISTC A-655 Project Diffusive Mechanism of Radiation in Random Media,
4) Grant of Sweden Royal Academia (Cooperation grant between Sweden and the former Soviet Union), Project Title: The New Approaches in the Quantum Theory of Reactive Scattering and its Application to Investigation of Elementary Chemical Reactions -2006,
5) 2007-2010–ISTC A-1602 Project Free Electron Lasers on Smith-Purcell Radiation.

Selected Publications

G. G. Balint-Kurti, A. V. Bogdanov, A. S. Gevorkyan et al.,Grid-technology for chemical reactions calculation, *Trans. On Comput. Sci.*, VII, LNCS 5790-0335, Spinger-Verlage, (2010).

A. S. Gevorkyan, et al., A disordered 1D quantum N-particle system in an environment under the influence of an external field, *Phys. Scripta*, pp1-4 (2010), 014045: DOI:10.1088/0031-8949/2010/T140/014045:

A. S. Gevorkyan, Nonrelativistic Quantum Mechanics with Fundamental Environment, *Foundation of Physics* (2011), 41, Issue 3, pp 509-515. DOI 10.1007/s10701-010-9446-y

A. S. Gevorkyan, G. G. Balint-Kurti, G. Nyman: Novel algorithm for simulation of 3D quantum reactive atom-diatom scattering. *Procedia Computer Science, V.1 (1),* pp 1195-1201 (2010). 10.1016/j.procs.2010.04.133

R. Sh. Sargsyan, G. G. Karamyan, A. S. Gevorkyan et al., Nonlocal interactions between two spatially divided light fluxes. *AIP Proc. of the International Conference on Advances in Quantum Theory*, N1327, pp. 465-471, (2012).

A. S. Gevorkyan and A. A. Gevorkyan, Maxwell electrodynamics subjectedto quantum vacuum fluctuations, *Physics of Atomic Nuclei*, 74, No. 6, pp. 901–907 (2011).

A. S. Gevorkyan and H. G. Abajyan, On the description of a frustrated classical system within the conception of probability foundations, Foundation of Probability and Physics, *AIP Conf. Proc.*, N 1424, pp. 95-104 (2012). Doi:10.1063/1.3688957.

A. S. Gevorkyan and H. G. Abajyan, A new parallel algorithm for simulation of spin glasses on scales of space-time periods of external fields with consideration of relaxation effects, *Physics of Particles and Nuclei Letters*, 9, No. 6–7, pp. 530–540 (2012).

A. S. Gevorkyan (2012). Nonrelativistic quantum mechanics with fundamental environment, Theoretical Concepts of Quantum Mechanics, pp 161-186, Prof. M. R. Pahlavani (Ed.), ISBN: 978-953-51-0088-1, In Tech, Available from:http://www.intechopen.com/books/theoretical-concepts-of-quantum-mechanics/nonrelativisticquantum-mechanics-with-fundamental-environment

A. S. Gevorkyan and H. G. Abajyan, Classical spin glass system in external field with taking into account relaxation effects, *Physics of Atomic Nuclei*, 2013, Vol. 76, No. 8, pp. 1015–1025. DOI:10.1134/S1063778813080127

A. S. Gevorkyan, Nonrelativistic quantum mechanics with consideration of influence of fundamental environment, *Physics of Atomic Nuclei*, 2013, Vol. 76, No. 8, pp. 101l0–1014. DOI: 10.1134/S1063778813080115

E. A. Ayryan, A. S. Gevorkyan and L. A. Sevastyanov, A new dynamical system on the potential energy hypersurface of the classical three body problem, *Physics of Particles and Nuclei Letters* (2013), 2013, Vol. 10, No. 7, pp. 1–8.

A. S. Gevorkyan, On reduction of the general three-body Newtonian problem and the curved geometry, *Journal of Physics*: Conference Series, 496 (2014) 012030 DOI:10.1088/1742-6596/496/1/012030

E. A. Ayryan, A. S. Gevorkyan and V. V. Sahakyan, New algorithm for simulation of 3D classical spin glasses under the influence of external electromagnetic fields, *Physics of Particles and Nuclei Letters*, 2015, Vol. 12, No. 3, pp. 380– 384.

A.S. Gevorkyan, K.B. Oganesyan, Yu.V. Rostovtsev, G. Kurizki, Gamma radiation production using positron annihilation in ionic crystals, *Laser Physics Lett.*, 12, 7, 2015.

A.S. Gevorkyan and V. V. Sahakyan, Computation of disordered system from the first principles of classical mechanics and NP hard problem, *Physics of Atomic Nuclei*, **2017**, Vol. 80, No. 2, pp. 366–372.

A.S. Gevorkyan, On the motion of classical three-body system with consideration of quantum fluctuations, *Physics of Atomic Nuclei*, **2017**, Vol. 80, No. 2, pp. 358–365.

A. S. Gevorkyan, Quantum Vacuum, the Structure of "Empty" Space-Time, *Physics of Atomic Nuclei*, **2018**, Vol. 81, No. 6, pp. 809-818.

A.S. Gevorkyan, Quantum Vacuum: The Structure of Empty Space–Time and Quintessence with Gauge Symmetry Group SU(2)xU(1), *Particles*, **2019**, Vol. 2(2), pp. 281-308; doi:10.3390/particles2020019

A.S. Gevorkyan, New Concept for Studying the Classical and Quantum Three-Body Problem: Fundamental Irreversibility and Time's Arrow of Dynamical Systems. *Particles*, **2020**,, Vol. 3, pp. 576-620. doi: 10.3390/particles3030039

Participation in conferences during the last five years (2013-2018) with an oral talk, including as a guest speaker

1. A.S. Gevorkyan, Partial integrability of general three-body problem, Integrable Systems and Quantum Symmetries, 12 – 16 June, 2013, Prague, Czech Republic XXI International Colloquium.
2. A.S. Gevorkyan, Modeling of 3D classical spin glasses under influence of external electromagnetic fields, The International Conference MATHEMATICAL MODELING AND COMPUTATIONAL PHYSICS, 8 – 12 July 2013, Dubna, Russian Federation.
3. A. S. Gevorkyan, On reduction of general three-body Newtonian problem and curved geometry, The Modern Physics of Compact Stars and Relativistic Gravity, September 18-21 September, 2013, Yerevan, Republic of Armenia.
4. A. S. Gevorkyan, Simulation of statistical parameters of 3D classical spin glasses at influence of external electromagnetic fields, 9th International Conference on Computer Science and Information Technologies, 23 - 27 September, 2013, Yerevan, Republic of Armenia.
5. A. S. Gevorkyan, Exactly constructed model of non-relativistic quantum mechanics with random environment, 13 - 21 August, 2014, Seoul, Korea.
6. A. S. Gevorkyan and V. V. Sahakyan, Calculations from the first principles, and reduction of NP hard problem to the P problem on the example of 1D spin-glass, Armenian Mathematical Union Annual Session, 2015, Yerevan, Armenia.
7. A. S. Gevorkyan, The classic three-body problem in general case as a system of 6th order, Armenian Mathematical Union Annual Session 2015, Yerevan, Armenia.
8. A. S. Gevorkyan, On the motion of classical three-body system with consideration of quantum fluctuations, The 9th International Conference, Quantum Theory and Symmetries (QTS-9), 2015, Yerevan, Armenia.
9. A. S. Gevorkyan and V. V. Sahakyan, Modeling of spin glasses from first principles of classical mechanics, The 9th International Conference, Quantum Theory and Symmetries (QTS-9), 2015, Yerevan, Armenia.
10. A. S. Gevorkyan, The quantum vacuum and the structure of empty spacetime, The Modern Physics of Compact Stars and Relativistic Gravity, 2015, Yerevan, Armenia.
11. A. S. Gevorkyan, On problem of ab-initio simulation of disordered media, IV International Conference, Current Problems of chemical physics, pp 214-215, 2015, Yerevan, Armenia.
12. A.S. Gevorkyan et al., Entangling of quantum states at the relaxation of the Hilbert space, Arm. Math., Union Ann. Ses., 2016, Yerevan, RA, 30 May to June 1.
13. A.S. Gevorkyan, Classical nonintegrability, quantum irreversibility and chaos on the example of three-body problem, Int. Workshop On Few-Body Systems, 2016, JINR, Dubna, Russia, July 4 – 7.
14. A.S. Gevorkyan et al., Entangling of photons and creation of qubits via a random surroundings, Cont. Mech. and Rel. Prob. of Anal., 2016, Batumi, Georgia, 4-9 Sep.

15. A.S. Gevorkyan, Poincare Conjecture, Classical nonintegrability and quantum chaos on the example of 3 bodies, Cont. Mech. and Rel. Prob. of Analy., 2016, Batumi, Georgia, 4-9 September.
16. A. S. Gevorkyan, Formation of Massless Bose Particles with Spins 1 as a Result of Random Fluctuations of Vacuum Fields, Yerevan, Armenia, May 27-June 2, 2018.
17. A. S. Gevorkyan, Quantum Vacuum, the Structure of "Empty" Space-Time and the Quintessence, The 32nd international Colloquium on Group Theoretical methods in Physics, July 09-13, 2018, Prague, Czech Republic.
18. A. S. Gevorkyan, Quantum Vacuum-Quintessence as the Natural Quantum Computer, International Conferance Dedicated to Memory Sergey Mergelyan, May 20 - 25, 2018, Yerevan, Armenia.
19. A.S. Gevorkyan, On Formation of Massless Bose Particles Hions in the Quantum Vacuum. Problem of Dark Energy-Quintessence, IX International Conference of the Georgian Mathematical Union September 3-8, 2018, Batumi-Tbilisi, Georgia.
20. A. S. Gevorkyan, Riemannian geometry as a tool for solving a number of fundamental problems of Hamiltonian mechanics, International Conference Dedicated to 100^{th} birth of Mkhitar Djrbashyan, October 22-24, 2018, Yerevan, Armenia.