Curriculum Vitae

Personal

Name:	**Tigran Hakobyan**
Date and place of birth:	29 January 1965, Yerevan, Armenia, USSR
Citizenship:	Armenia
Marital status:	married and have two children
Mailing address:	Yerevan State University, Faculty of Physics, A. Manoogian St., 1, Yerevan, 0025, Armenia
Permanent position:	Senior Researcher, Yerevan State University, Laboratory of Theoretical Physics, Alex Manoogian St., 1, Yerevan 0025, Armenia
Telephones:	(374)10-340841 (home), (374)10-578841 (office)
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Languages spoken :	Armenian, Russian, English, French

Education and degrees

2013	Doctor of Science(Physics), Yerevan State University **Thesis**:"Exact Methods in One-Dimensional and Quasi-One-Dimensional Systems"
1996	Ph.D in Theoretical and Mathematical Physics, Yerevan Physics Institute **Thesis**:"R-matrices and Quantum Groups" Adviser: A.G.Sedrakian
1989 - 1992	PhD student, Yerevan Physics Institute, Theory Division,
1989	MSc, Yerevan State University
1982 - 1989	student, Yerevan State University, Faculty of Physics, Yerevan.

Present and past interests of research

- Integrable structures in quantum field theory and statistical physics
- quantum spin chains, spin ladder models
- Quantum groups, Yang-Baxter equations, Hubbard model.

Professional employment

since 2006   Senior Researcher, Department of Theoretical Physics, Yerevan State University

2003 - 2005   Associate Professor, Department of Theoretical Physics, Yerevan State University

since 1999   Senior Researcher, Yerevan Physics Institute,Theory Department, Yerevan

1998-1999   Post doctoral fellow, Service de Physique de l'Etat Condense,
                        & CEA, Centre d'Etudes de Saclay, 91191 Gif sur Yvette Cedex, France

1996 - 1998   Assistant Professor,Yerevan State University,
                        Department of Theoretical Physics, Yerevan

1993 - 1998   Junior Researcher, Yerevan Physics Institute,Theory Department
                        Yerevan, Armenia

Computer programming skills

Working experience in C/C++, Fortran, MPI multi-processor library, Mathematica.

Recent conferences, workshops

- *Supersymmetry in Integrable Systems*,
  9-13.09.2015; 27-30.08.2012; 24-28.08.2010, Yerevan;
  11-13.09.2014, Dubna;
  28-30.12. 2013; 01-04.08.2011 Hannover, Germany;

- *Supersymmetry and Quantum Symmetries*, 3-8.08.2015; 29.07-03.08.2009, Dubna

- *The 9th International Conference Quantum Theory and Symmetries (QTS-9)*, 13-18.07. 2015, Yerevan

- *Armenia-Dubna Workshops on Problems of (supersymmetric) Integrable Systems*, Dubna
  24-26.12.2013; 24-25.12.2012.

- *Aspects of Integrable Systems and AdS/CFT*, 01.11.2012, Tehran

- *Modern problems of physics of low-dimensional systems*, 21-22.03.2012, Yerevan

- *Modern Problems in Optics and Photonics*, 27.08-02.09.2009, Yerevan

- *XIX Colloquium on Integrable Systems and Quantum Symmetries*, 18-20.06.2009, Prague

- *Group-theoretical methods in Physics*, 11-17.08.2008, Yerevan

- *"Integrable systems: From Strings to Conformal Field Theories"*, Nor Amberd-Tbilisi, 1-4.10.2007

- *Supersymmetries and Quantum Symmetries*, 30.07-04.08, 2007, Dubna, Russia

- *Symmetry Methods in Physics*, July 03-08, 2006, Yerevan

- *Modern Problems of Theoretical and Mathematical Physics*, September 20-25, 2004, Tbilisi, Georgia.

- *Gauge Fields and Strings*, May 26-30, 2003, Yerevan, Armenia.

- *Statistical Physics and Dynamical Systems: Methods and Applications*, Workshop, September 18-23, 2003, Nor-Amberd and Tsakhajor, Armenia.

- *Modern Problems of Theoretical and Mathematical Physics*, September 20-25, 2002, Tbilisi, Georgia.

- *Low dimensional integrable models and their applications in field theory and statistical physics*, May 20-25, 2001, Annecy-le-Vieux, France.

Grants

- State Committee of Science of Armenia

  "Supersymmetric integrable models in low dimensions"
    15RF-039(2015)
  "Novel integrable systems in quantum mechanics"
    13-1C114
  "Supersymmetric integrable systems in quantum mechanics, field theory and gravity"
    13RF-018 (2013)
  "Geometric models of two- and one- dimensional integrable systems",
  SCS 11-1c258 (2011)
  "Mathematical models for low-dimensional quantum structures in external fields",
  SCS-BFBR 11AB-001 (2011)

- Volkswagen Stiftung
  Regional Training Center on Theoretical Physics: Bonn-Tbilisi-Yerevan
    Contract No. 86 260 (2012) 3 years

  Algebraic and geometric properties of (conformal) mechanics with extended supersymmetry
    I/84 496 (2009) 4 years

  "Non-perturbative aspects of quantum field theory in various space-time dimensions" (2005) 2 years.

- ICTP Network
  Novel approaches to mesoscopic phenomena (Armenia-Georgia-Iran-Morocco-Turkey-Ukraine)
  NET-68(2012)

- ANSEF- Armenian National Science & Education Foundation based in New York

  "Spherical systems related to the rational Calogero models"
    3501-math- phys (2014) (`Principal Investigator`) 1 year.

  "Conformal mechanics, Calogero models and related spherical systems",
  PS2908 (2012) (`Principal Investigator`) 1 year.

  "Geometric properties of novel supersymmetric mechanics systems",
  PS2229(2010)1 year.

  "Multiple spin exchanges, cubic symmetry and frustrated spin systems"
  PS1386(2008) 1 year.

- U. S. Civilian Research and Development Foundation (CRDF) & National Foundation for Science and Advanced Technology (NFSAT),
  "Algebraic and geometric studies for condensed matter physics",(`Project Leader`) 2007, 2 years UCEP 06/07

- Swiss SCOPE grant.

List of publications

1. **"Integrability and separation of variables in Calogero-Coulomb-Stark and two-center Calogero-Coulomb systems"**
   T. Hakobyan and A. Nersessian.
   arXiv:1509.01077 [math-ph]

2. **"Runge-Lenz vector for Calogero-Coulomb problem"**
   T. Hakobyan and A. Nersessian
   Phys. Rev. A **91** (2015) [arXiv:1504.00760][hep-th]

3. **"Superintegrability of generalized Calogero model with oscillator or Coulomb potential"**
   T. Hakobyan, O. Lechtenfeld, A. Nersessian
   Phys. Rev. D **90** (2014) 101701(R) [arXiv:1409.8288][hep-th]

4. **"Lowest-energy states in parity-transformation eigenspaces of SO(N) spin chain"**
   T. Hakobyan.
   Nucl. Phys. B **898**, 248 (2015)

5. **"On the algebra of Dunkl angular momentum operators"**
   M. Feigin and T. Hakobyan.
   arXiv:1409.2480 [math-ph]

6. **"The structure of invariants in conformal mechanics"**
   T. Hakobyan, D. Karakhanyan and O. Lechtenfeld.
   Nucl. Phys. B **886**, 399 (2014) [arXiv:1402.2288][hep-th]

7. **"Action-angle variables and novel superintegrable systems"**
   T. Hakobyan, O. Lechtenfeld, A. Nersessian, A. Saghatelian and V. Yeghikyan
   Physics of Particles and Nuclei, **43** (2012) 577-582
   Proc. of Workshop on Supersymmetries and Quantum Symmetries, Dubna, 18-23 July 2011

8. **"The spherical sector of the Calogero model as a reduced matrix model"**
   T. Hakobyan, O. Lechtenfeld and A. Nersessian
   Nucl. Phys. **B858** (2012), 250-266 [arXiv:1110.5253][math-ph]

9. **"Integrable generalizations of oscillator and Coulomb systems via action-angle variables"**
   T. Hakobyan, O. Lechtenfeld, A. Nersessian, A. Saghatelian and V. Yeghikyan
   Phys. Lett. **A376** (2012) 679686 [arXiv:1108.5189][math-ph]

10. **"Invariants of the spherical sector in conformal mechanics"**
    T. Hakobyan, O. Lechtenfeld, A. Nersessian and A. Saghatelian
    J. Phys. **A44** (2011) 055205 [arXiv:1008.2912][math-ph]

11. **Ordering of energy levels for $SU(N)$ extended Habbard chain**
    T. Hakobyan
    SIGMA **6** 024 (2010) [arXiv:1003.2147][cond-mat]

12. **"Hidden symmetries of integrable conformal mechanical systems"**
    T. Hakobyan, S. Krivonos, O. Lechtenfeld and A. Nersessian
    Phys. Lett. **A374**(2010), No. 5, 801-806 [arXiv:0908.3290]

13. **"Energy level ordering for the quantum mechanical system with interacting SU(N) fermions"**
    T. Hakobyan
    Proceedings of International Advansed Research Workshop on Modern problems in optics and photonics (27 August-2 September 2009, Yerevan, Armenia), Ed. G.Yu.Kryuchkyan, A.V.Papoyan, D.A.Antonosyan, 53-58, "Gitutun" Publ., Yerevan, 2010

14. **Energy level ordering for frustrated spin ladder models**
    T. Hakobyan,
    Phys. Atom. Nucl.**73**, No. 2, 339-344 (2010)
    Proc. of XXVII Colloquim on Group-theoretical methods in Physics, 11-17.08.2008, Yerevan

15. **"Cuboctahedric Higgs oscillator from the Calogero model"**
    T. Hakobyan, A. Nersessian and V. Yeghikyan
    J.Phys. **A42**(2009) 205206 [arXiv:0808.0430]

16. **"Lobachevsky geometry of (super)conformal mechanics"**
    T. Hakobyan and A. Nersessian
    Phys. Lett. A **373**, 1001 (2009) [arXiv:0803.1293 [hep-th]]

17. **Antiferromagnetic ordering of energy levels for a spin ladder with four-spin cyclic exchange: Generalization of the Lieb-Mattis theorem**
    T. Hakobyan
    Phys. Rev. B, **78**, 012407 (2008) [arXiv:0802.2392]

18. **Reflection Symmetry and energy-level ordering of frustrated ladder models**
    T. Hakobyan,
    Proc. of Workshop on Supersymmetries and Quantum Symmetries, Dubna, July 30- August 4, 2007, Ed. E. Ivanov, S. Fedoruk, pp.383-386, JINR Publ. 2008

19. **Energy-level ordering and ground-state quantum numbers for a frustrated two-leg spin-1/2 ladder**
    T. Hakobyan
    Phys. Rev. B, **75**, 214421 (2007)

20. **Grid-Technology for Chemical Reactions Calculation**
    G. Balint-Kurti, A. Bogdanov, A. Gevorkyan, Yu. Gorbachev, T. Hakobyan, G. Nyman, I. Shoshmina, and E. Stankova,
    Lect. Notes Comp. Sc., **3516/2005**, 933-936 (2005)

21. **The ordering of energy levels for $SU(n)$ symmetric antiferromagnetic chains**
    T. Hakobyan
    Nucl. Phys. B **699**, 575-594 (2004)

22. **The possibility of gapless excitations in antiferromagnetic spin chains with long-range interactions**
    T. Hakobyan
    J. Phys. A: Math. Gen. **36**, L599-L604 (2003)

23. **An overview on the phase diagram of frustrated two-leg ladder model**
    T. Hakobyan, J.H. Hetherington and M. Roger,
    Proceedings of the Workshop "Low dimensional integrable models and their applications in field theory and statistical physics", pp. 35-47, Ed. A. G. Bytsko and M. Karowski, 2001

24. **Phase diagram of the frustrated two-leg ladder model**
    T. Hakobyan, J.H. Hetherington and M. Roger,
    Phys. Rev. B **63**, 144433-144449 (2001)

25. **Delocalization of states in two component superlattices with correlated disorder**
    T. Hakobyan, D. Sedrakyan, A. Sedrakyan, I. Gomez, F. Dominiguez-Adame,
    Phys. Rev. B **61**, 11432-11436 (2000)

26. **Luminescence excitation and influence of radiation on the stimulated processes in corundum crystals**
    V. Harutunyan, E. Hakverdyan, T. Hakobyan, V. Gevorkyan, V. Grigoryan and V. Markov,
    Phys. Stat. Sol. A **171**, 623-629 (1999)

27. **Luminescence quantum yield and multiplication of electronic excitations in the corundum crystals**
V. Harutunyan, T. Hakobyan, V. Gevorkyan and V. Markov,
Eur. Phys. J. B **12**, 31-33 (1999)

28. **Optical Constants and Functions of Corundum Single Crystals in the Vacuum Ultraviolat Region**
V. Harutunyan, T. Hakobyan, A.Hovhannesian, V. Gevorkyan, N.Grigoryan, A.Avakyan, V.Grigoryan
[arXiv:cond-mat/9806352]

29. **"Bethe Ansatz and Thermodynamic Limit of Affine Quantum Group Invariant Extensions of the t-J Model"**
J. Ambjorn, A. Avakyan, T. Hakobyan and A. Sedrakyan
J. Math. Phys. **40**, 5687 (1999) [arXiv:cond-mat/9802204]

30. **"A New Family of Integrable Extended Multi-band Hubbard Hamiltonians"**
J. Ambjorn, A. Avakyan, T. Hakobyan and A. Sedrakyan
Mod. Phys. Lett. A **13**, 495 (1998) [arXiv:cond-mat/9702128]

31. **Integrable extensions of Hubbard Hamiltonian**
A. Avakyan, T. Hakobyan and A. Sedrakyan,
Int. J. Mod. Phys. **B 11**, 3207-3222 (1997)

32. **Family of affine quantum group invariant integrable extensions of Hubbard Hamiltonian**
A. Avakyan, T. Hakobyan and A. Sedrakyan,
Nucl. Phys. **B 490**, 633-652 (1997)

33. **Spin chain Hamiltonians with affine $U_q\hat{g}$ symmetry**
T. Hakobyan and A. Sedrakyan,
Phys. Lett. **B 377**, 250-254 (1996)

34. **"On the universal R-matrix of $U_q\hat{sl}_2$ at roots of unity"**
T. Hakobyan and A. Sedrakyan
Commun. Math. Phys. **117**, 157 (1996) [arXiv:q-alg/9501016]

35. **Lattice electrons in constant magnetic field: Bethe like ansatz**
T. Hakobyan and A. Sedrakyan,
Mod. Phys. Lett., A **10**, 495-501 (1995)

36. **Universal R-matrix of $U_q sl_{n,m}$ quantum superalgebras**,
T. Hakobyan and A. Sedrakyan,
J. Math. Phys. **35**, 2552-2559 (1994)

37. **R-matrices for $U_q\widehat{osp}(1,2)$ for highest weight representations of $U_q osp(1,2)$ for general q and q an odd root of unity**
T. Hakobyan and A. Sedrakyan,
Phys. Lett. **B308**, 266-271 (1993)

38. **Some new spinor representations of quantum groups $U_q B_n$, $U_q C_n$ and $U_q G_2$**
T. Hakobyan and A. Sedrakyan,
J. Math. Phys. **34**, 2554-2560 (1993)

39. **R-matrices for highest weight representations of $\widehat{sl}_q(2,C)$ at roots of unity**,
T. Hakobyan and A. Sedrakyan,
Phys. Lett. **B303**, 27-32 (1993)