

## CURRICULUM VITAE

Name: VADIM OHANYAN

Born: 10 August 1976, Baku, USSR  
Nationality: Republic of Armenia

Marital state: Single

Permanent Address: Laboratory of Theoretical Physics  
Yerevan State University  
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### EDUCATION:

1998-2001 PhD student at the Chair of Theoretical Physics  
Yerevan State University, Yerevan

1993-1998 Student of the Physics Faculty  
Yerevan State University

### DEGREES:

2003 PhD in Theoretical Physics (Yerevan Physics Institute)

Thesis: "Phase Transitions and  
Magnetization plateaus in Spin Systems: Recursive Lattices,  
One-dimensional Chains and Non-linear  $\sigma$ -model"  
supervisor: Professor N. S. Ananikian

1998 M. S. in Physics, Yerevan State University, Yerevan

### EMPLOYMENT:

2013-2014 Institute for Theoretical Physics  
Leibniz University Hannover,  
Postdoc

2011-2015	ICTP Junior Associate
2006-2009	Department of General and Theoretical Physics, Russian–Armenian University, Yerevan Associate Professor
2002-Present	Laboratory of Theoretical Physics, Yerevan State University Researcher
2002-2012	Department of Theoretical Physics, Yerevan State University Assistant Professor
1999-2011	Department of Theoretical Physics, Yerevan Physics Institute, Researcher

### **TEACHING ACTIVITY. COURSES GIVEN SINCE 2000:**

Introduction to the Bethe-ansatz technique (YSU 2011-2012)  
 Classical electrodynamics (YSU 2000-2012)  
 Quantum Field Theory (YSU 2001-2002)  
 Thermodynamics and Statistical Physics(YSU 2002-2012)  
 Introduction to Statistical Mechanics for Biophysicists(YSU 2002-2008)  
 Phase Transitions and Critical Phenomena(YSU 2003-2012)  
 General Physics (RAU 2006-2008 For students of Medical–biological faculty)  
 Introduction to Quantum Spin Chains  
 (Regional Training Center in Theoretical Physics, 2016)

### **DIPLOMA WORKS SUPERVISION**

Martiros Khurshudyan, master thesis (2010, YSU)  
 Martiros Khurshudyan (2008, YSU)  
 Bilor Kurghinyan (2007, YSU)  
 Diana Antonosyan (2006, YSU)

### **SCIENTIFIC INTERESTS:**

main fields: Theoretical Condensed Matter Physics, Statistical Mechanics,  
 Quantum Field Theory, Mathematical Physics

particular fields: Integrable Models, Strongly Correlated Systems, Theory of Magnetism

### **SHORT-TERM RESEARCH VISITS (up to 3 months):**

2015	Institute for Condensed Matter Physics, Lviv, Ukraine
2015	LNF-INFN, Frascati, Italy
2015	ICTP, Trieste, Italy

2015 LNF-INFN, Frascati, Italy  
 2014 Institute for Condensed Matter Physics, Lviv, Ukraine  
 2014 LNF-INFN, Frascati, Italy  
 2013 LNF-INFN, Frascati, Italy  
 2013 Institute of Physics, UvA, Amsterdam, Netherlands  
 2013 LNF-INFN, Frascati, Italy  
 2012 ICTP, Trieste, Italy  
 2012 LNF-INFN, Frascati, Italy  
 2012 Bergische Universität, Wuppertal, Germany  
 2012 Institute für Theoretical Physics, Georg-August Universität,  
 Göttingen, Germany  
 2011 ICTP, Trieste, Italy  
 2011 Institute für Theoretical Physics, Georg-August Universität,  
 Göttingen, Germany  
 2010 Institute für Theoretical Physics, Georg-August Universität,  
 Göttingen, Germany  
 2009 LNF-INFN, Frascati, Italy  
 2009 Bergische Universität, Wuppertal, Germany  
 2009 Institute für Theoretical Physics, Georg-August Universität,  
 Göttingen, Germany  
 2008 LNF-INFN, Frascati, Italy  
 2007 LNF-INFN, Frascati, Italy  
 2007 ICTP, Trieste, Italy  
 2007 LNF-INFN, Frascati, Italy  
 2007 JINR, Dubna, Russia  
 2005 ICTP, Trieste, Italy  
 2002 JINR, Dubna, Russia  
 1997 JINR, Dubna, Russia

## LANGUAGES:

Russian (native)  
 English, Armenian (fluent)  
 German, Italian (basic)

## CONFERENCES:

2015 The IX-th International Symposium Quantum Theory and Symmetries  
 (QTS-9), Yerevan, Armenia  
 2014 Integrable Lattice Models and Quantum Field Theories,  
 Bad Honnef, Germany  
 2012 Problems of Supersymmetric Integrable System, Dubna, Russia  
 2012 Innovations in Strongly Correlated Electronic Systems, Trieste, Italy  
 2012 Workshop on Majorana Fermions, Non-Abelian Statistics  
 and Topological Quantum Information Processing, Trieste, Italy

2012 Quantum Magnetism in Low Spatial Dimensions, Bad Honnef, Germany  
 2012 Mini-workshop “Localized excitations in flat-band models,  
 Göttingen, Germany  
 2012 76th Annual Meeting of the DPG and DPG Spring Meeting,  
 Berlin, Germany  
 2011 Low-dimensional Physics and Gauge Principles, Nor-Amberd, Armenia  
 2011 Workshop on Synergies between Field Theory and Exact Computational  
 Methods in Strongly Correlated Quantum Matter, Trieste, Italy  
 2011 Fifth Stig Lundqvist Conference on the Advancing Frontiers of  
 Condensed Matter Physics, Trieste, Italy  
 2011 Topological Aspects of Condensed Matter Physics, Trieste, Italy  
 2011 Physics of Magnetism 2011, Poznan, Poland  
 2011 75th Annual Meeting of the DPG and DPG Spring Meeting,  
 Dresden, Germany  
 2010 Quantum Matter in Low Dimensions: Opportunities and Challenges,  
 Stockholm, Sweden  
 2010 Supersymmetry in Integrable Systems (SIS’10), Yerevan, Armenia  
 2010 Principles and design of strongly correlated electronic systems, Trieste, Italy  
 2010 14-th Czech and Slovak Conference on Magnetism (CSMAG’10),  
 Košice, Slovakia  
 2009 School on Attractor Mechanism (SAM 09), Frascati, Italy  
 2009 Statistical Physics 2009: Modern trends and Applications, Lviv, Ukraine  
 2008 Group Theoretical Methods in Physics (GROUPE 27), Yerevan, Armenia  
 2008 Integrable Systems and Quantum Symmetries, Prague, Czech Republic  
 2007 Conformal Field Theory and Integrability: From Condensed Matter Physics  
 to String Theory, Nor-Amberd–Tbilisi, Armenia–Georgia  
 2007 School and Workshop on Highly Frustrated Magnets and  
 Strongly Correlated Systems, Trieste, Italy  
 2007 Classical and Quantum Integrable systems, Dubna, Russia.  
 2007 5-th winter school on theoretical physics.  
 Superstrings, Conformal Field Theory and supergravity. Dubna, Russia.  
 2006 XII International conference on Symmetry Methods in Physics,  
 Yerevan, Armenia.  
 2005 Selected Topics in Theoretical Physics Tbilisi, Georgia  
 2005 Strongly Interacting Systems at the Nanoscale, Trieste, Italy  
 2004 Modern Problems in Theoretical and Mathematical Physics, Tbilisi, Georgia  
 2004 11-th Regional Conference on Mathematical Physics, Tehran, Iran.  
 2003 Dynamical Systems: Methods and Applications, Nor-Amberd, Armenia  
 2003 X International conference on Symmetry Methods in Physics,  
 Yerevan, Armenia.  
 2002 Integrability in QFT and Quantum Statistics, Tbilisi, Georgia.  
 2001 IX International conference on Symmetry Methods in Physics,  
 Yerevan, Armenia.  
 2000 Laser Physics-2000, Ashtarak, Armenia  
 2000 Chaos & Supercomputers, Nor-Amberd, Armenia

**CONFERENCES ORGANIZING COMMITTEE MEMBERSHIP:**

- 2010                    Supersymmetry in Integrable Systems (SIS'10), Yerevan, Armenia
- 2008                    Group Theoretical Methods in Physics (GROUP 27), Yerevan, Armenia
- 2007                    Conformal Field Theory and Integrability: From Condensed Matter Physics  
to String Theory, Nor-Amberd–Tbilisi, Armenia–Georgia
- 2003                    Dynamical Systems: Methods and Applications, Nor-Amberd, Armenia

## RESEARCH GRANTS

- ICTP

*Novel Approach for Mesoscopic phenomena*  
(Armenia-Iran-Morocco-Turkey-Ukraine)  
ICTP Network NET68, (2012)

- Volkswagen Foundation

*Regional Training Network in Theoretical Physics*  
(Bonn-Tbilisi-Yerevan),  
Volkswagenstiftung Contract nr. 86 260 (2012)

- Volkswagen Foundation

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

- CRDF - U.S. Civilian Research and Development Foundation & NFSAT - National Foundation for Science and Advanced Technology

*Algebraic and geometric studies for condensed matter physics*  
UC 06/07 (2007)

- DFG- Deutsche Forschungsgemeinschaft

*Exact finite temperature properties of the attractive Hubbard model in external magnetic fields*  
VE 627/3-1 (2013-2014)  
(DFG funded postdoc position in Leibniz University, Hannover)

*Exact Thermodynamic Description of the Magnetoelectric Effect in the XXZ-chain with Dzyaloshinskii-Moriya Interaction*  
KL 645/8-1 (2012)(Personal Visit Grant)

*Exact description of the magnetocaloric effect in the Suzuki model.*  
HO 2325/8-1 (2011) (Personal Visit Grant)

*Thermodynamics for quantum magnets with Ising and Heisenberg bonds*  
HO 2325/7-1 (2010) (Personal Visit Grant)

*Magnetocaloric effect in quantum spin chains and exactly solvable Ising-Heisenberg spin systems*  
HO 2325/4-1 (2009) (Personal Visit Grant)

- ANSEF - Armenian National Science and Education Foundation

*Exact solutions of the lattice spin models with Ising and Heisenberg bond and thermodynamics of magnetic materials (Principal Investigator )*  
(2011) PS 2497

*Entanglement as a measure of quantum correlations in many body fermionic system*  
(2010) PS 1981

*Critical behavior, magnetization plateaus, entanglement, bifurcation points and chaotic states of spin systems*  
(2009) PS 1518

*Multiple spin exchanges, cubic symmetry and frustrated spin systems (Principal Investigator )*  
(2008) PS 1386

*Phase transitions in terms of complex zeroes of the partition function*  
(2003)

*Integrability and duality in brains, quantum strings and field theory*  
(2001)

- Joint grant of the State Committee of Science of Armenian and CRDF-NFSAT, Early Careers Support Program (ECSP)

*Low-dimensional exactly solvable models with Ising and Heisenberg bonds and properties of some magnetic materials.(Principal Investigator)*  
(2010) ECSP-09-94-SASP

- INTAS - The International Association for the Promotion of Co-operation with Scientists from the New Independent States of the Former Soviet Union

*Extended supersymmetry, strings and noncommutativity in field theory,*  
(2006)INTAS-05-7928

## AWARDS

RA President's Prize in Physics for the series of scientific articles "Problems in Quantum Mechanics related to the Condensed Matter Physics" together with Armen Nersessian, Tigran Hakobyan and Vahagn Yeghikyan (2011)

## LIST OF PUBLICATIONS

1. **V. Ohanyan**, O. Rojas, J. Strečka, and S. Bellucci, Absence of actual plateaus in zero-temperature magnetization curves of quantum spin clusters and chains, *Phys. Rev. B* **92**, 214423 (2015).
2. O. Menchyshyn, **V. Ohanyan**, T. Verkholyak, T. Krokhmalskii, and O. Derzhko, Magnetism-driven ferroelectricity in spin-1/2 XY chains, *Phys. Rev. B* **92**, 184427 (2015).
3. S. Bellucci and **V. Ohanyan**, and O. Rojas, Magnetization non-rational quasi-plateau and spatially modulated spin order in the model of the single-chain magnet,  $[(\text{CuL})_2\text{Dy}]\{\text{Mo}(\text{CN})_8\} \cdot 2\text{CH}_3\text{CN} \cdot \text{H}_2\text{O}$ , *EPL* **105**, 47012 (2014).
4. E. Gevorgyan, A. Nersessian, **V. Ohanyan**, and E. Tolkachev, Landau problem on the ellipsoid, hyperboloid and paraboloid of revolution, *Mod. Phys. Lett. A* **29**, 14501 (2014).
5. S. Bellucci and **V. Ohanyan**, Correlation functions in one-dimensional spin lattices with Ising and Heisenberg bonds, *Eur. Phys. J. B* **86**, 446 (2013).
6. M. Brockmann, A. Klümper, and **V. Ohanyan**, Exact description of the magnetoelectric effect in the spin-1/2 XXZ-chain with Dzyaloshinskii-Moriya interaction, *Phys. Rev. B* **87**, 054407 (2013).
7. M. Topilko, T. Krokhmalskii, O. Derzhko and **V. Ohanyan**, Magnetocaloric effect in spin-1/2 XX chains with three-spin interactions, *Eur. Phys. J. B* **85**, 278 (2012).
8. **V. Ohanyan** and A. Honecker, Magneto-thermal properties of the Heisenberg-Ising orthogonal-dimer chain with triangular XXZ-clusters, *Phys. Rev. B* **86**, 054412 (2012).



9. O. Rojas, S. M. de Souza, **V. Ohanyan** and M. Khurshudyan, Exactly solvable model of Ising-Heisenberg diamond-chain with  $S = 1$   $XXZ$  vertical dimers with additional biquadratic interactions and single-ion anisotropy, Phys. Rev. B **83**, 094430 (2011).
10. S. Bellucci and **V. Ohanyan**, Lattice distortions in sawtooth chain with Heisenberg and Ising bonds, Eur. Phys. J.B **75**, 531 (2010).
11. **V. Ohanyan**, Phase diagrams of the Ising-Heisenberg chain with  $S=1/2$  triangular  $XXZ$  clusters, Phys. Atom. Nucl. **73**, 494 (2010).
12. C. Trippe, A. Honecker, A. Klümper, and **V. Ohanyan**, Exact calculation of the magnetocaloric effect in the spin-1/2  $XXZ$  chain, Phys. Rev. B **81**, 054402 (2010).
13. **V. Ohanyan**, Antiferromagnetic sawtooth chain with Heisenberg and Ising bonds, Condensed Matter Physics, **12**, 343 (2009).
14. D. Antonosyan, S. Bellucci and **V. Ohanyan**, Exactly solvable Ising-Heisenberg chain with triangular  $XXZ$ -Heisenberg plaquettes, Phys. Rev. B **79**, 014432 (2009).
15. S. Bellucci, **V. Ohanyan**, Two-center quantum MICZ-Kepler system and Zeeman effect in the charge-dyon system, Phys. Lett. A **372**, 5765 (2008).
16. A. P. Nersessian and **V. R. Ohanyan**, Multi-center MICZ-Kepler systems, Theor. Math. Phys. **155(1)**, 618 (2008)
17. S. Bellucci, S. Krivonos, **V. Ohanyan**,  $N=4$  Supersymmetric MICZ-Kepler systems on  $S^3$ , Phys. Rev. D **76**, 105023 (2007)
18. S. Krivonos, A. P. Nersessian and **V. R. Ohanyan**, Multi-center MICZ-Kepler system, supersymmetry and integrability, Phys. Rev. D **75**, 085002 (2007)
19. **V. R. Ohanyan**, L. N. Ananikyan and N. S. Ananikian, An exact solution on the ferromagnetic Face-Cubic spin model on a Bethe lattice, Physica A **377**, 501 (2007).

20. B. Kurghinyan, S. Gevorgyan and **V. R. Ohanyan**, Peculiarities of a specific heat of superconductors: their relation to the paramagnetic effect detected by an OFC-based test-method, in SOLID STATE PHYSICS Proceedings of the Conference dedicated to 50-th anniversary of the foundation of the Department of Solid State Physics of YSU, p. 125 (2007) (in armenian)
  
21. **V. R. Ohanyan** and N. S. Ananikian, Magnetization plateaux in the Ising limit of the multiple-spin exchange model on plaquette chain. in MATHEMATICAL PHYSICS Proceedings of the XI Regional Conference Tehran, Iran 2004 ed. by S Rahvar, N Sadooghi and F Shojai,p.49-51 (World Scientific) (2005)[arXiv:/cond-mat 0612630]
  
22. N. S. Ananikian and **V. R. Ohanyan**, Ferromagnetic reduced N-vector model with a cubic symmetry on the Bethe lattice, J.Contemp. Phys. **38**, 8 (2003).
  
23. **V. R. Ohanyan**, N. S. Ananikian, Magnetization plateaus in the ferromagnetic-ferromagnetic-antiferromagnetic Ising chain, Phys. Lett. **A 307**, 76 (2003)
  
24. T. A. Arakelyan, **V. R. Ohanyan**, L. N. Ananikyan, N. S. Ananikian, M. Roger. The multisite interaction Ising model approach to Solid  $^3\text{He}$  system on the triangular lattice, Phys. Rev. **B 67**, 024424 (2003)
  
25. **V. R. Ohanyan**, The SU(2) WZNW model on manifolds with boundary, J.Contemp. Phys. **35**, 5 (2000).
  
26. S. A. Apikyan, **V. R. Ohanyan**, Local WZW-theory on a Manifold with Boundary Mod. Phys. Lett. **A13**, 3009 (1998).