

Curriculum Vitae of Vadim Cheianov

Vadim Cheianov

November 2008

Born: March 15, 1973, St. Petersburg, Russia.
Nationality: Russian.

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Academic Degrees

M.Sc. in Technology, St. Petersburg Technical University, December 1996. Diploma thesis: *Kinetics of Intrachain Collisions in Macromolecules*. Thesis advisor: Prof. Robert A. Suris.

Ph.D. in theoretical physics, Uppsala University, May 1999. Ph.D. thesis: *On Transport Theory of Correlated Mesoscopic Systems*. Thesis advisor: Dr. Anton Alekseev. Opponent: Prof. Markus Buttiker.

Employment history

January 1996 to May 1999: Doctorand at the Institute for Theoretical Physics, Uppsala University.

April 1998 to May 1998: Research assistant at the Lyman Laboratory, Harvard (prof. B. Halperin)

June 1999 to January 2001: Postdoctoral fellow at the Niels Bohr Institute, University of Copenhagen.

January 2001 to April 2005: NORDITA assistant professor

April 2005 to present: Academic Fellow and Lecturer at Lancaster University

Teaching Experience

(i) Teaching Assistance

Graduate course in Statistical Physics and Critical Phenomena, Uppsala (1997)

Undergraduate course in Mathematical Methods of Physics, Uppsala (1997)

Graduate course on Classical Mechanics, Uppsala (1998)

Undergraduate course on Statistical Mechanics, Uppsala (1998)

(ii) University Lecture Courses

Universe as an Art seminar, Lancaster (2006 – present)

First year quantum mechanics, Lancaster (2005 – present)

First year classical mechanics, Lancaster (2006 – present)

Third year nuclear and atomic physics, Lancaster (2007 – present)

(iii) Summer Schools and Invited Lecture Courses

Introduction to Conformal Field Theory, NORDITA Course on Quantum Field Theory in Particle and Condensed Matter Physics, Copenhagen (August 2001);

Theoretical introduction to Quantum Hall effects, NORDITA Summer School on Strongly Correlated Electrons (July 2003);

Graduate Course on Methods in Modern Condensed Matter Physics, BITP, Kiev (March and September 2006);

Introduction to bosonization, College on Physics of Nano-Devices, ICTP, Trieste (July 2006);

Introduction to bosonization and the Tomonaga-Luttinger Model, The 4th Windsor Summer School 'Quantum Transport and Dynamics in Nanostructures', Windsor (August 2007)

Administrative Duties

2006 – Present: organizer of the departmental Condensed Matter Seminar at Lancaster Physics

2007 – Present: chair of the Classical & Quantum Mechanics Theme Group at Lancaster Physics

Community Service

Referee: Science Magazine, Physical Review Letters, Europhysics Letters, Physical Review B, Journal of Physics A.

Organizational experience

1999 Co-organiser of the Ascona Meeting on Mesoscopic Physics and Transport Phenomena

2003 Organiser of the NORDITA Summer School on Strongly Correlated Electrons

2006 Co-organiser of the "Nanoelectronics 2006" Conference in Lancaster

Awards

University of Lancaster Research Prize 2007

Postgraduate student supervision:

Mikhail Zvonarev, 2002-2005; PhD thesis: *Correlations in 1D Boson and Fermion Systems*.

Nathan Davies, 2007-present; project title: *Electron transmission through p-n interfaces in monolayer and bilayer graphene*.

Eugene Suprunenko, 2007-present; project title: *Correlated electron states in graphene-based systems*.

Participation in national and international conferences

Organization:

1999 Co-organiser of the Ascona Meeting on Mesoscopic Physics and Transport Phenomena

2003 Organiser of the NORDITA Summer School on Strongly Correlated Electrons

2006 Co-organiser of the "Nanoelectronics 2006" Conference in Lancaster

Invited talks:

June 2004, third meeting for the Nordic project on *Strongly Correlated Electron Systems*, NORDITA, Copenhagen

June 2005, "Landau Days", Landau Institute, Chernogolovka

August 2005, "Conference on strongly interacting systems at the nanoscale", ICTP, Trieste

June 2006, INSTANS Summer Conference "Interdisciplinary Statistical and Field Theory Approaches to Nanophysics and low-dimensional Systems", Villa Olmo, Como Lago

July 2006, "Ascona meeting on strongly correlated low dimensional systems", Monte Verita, Ascona

July 2006, "College on Physics of Nano-Devices", ICTP, Trieste

August 2006, International Seminar and Workshop, "Dynamics and Relaxation in

Complex Quantum and Classical Systems and Nanostructures", MPI PKS, Dresden
September 2006, International Conference "*Graphene week 2006*", MPI PKS
Dresden

June-July 2007, workshop "*Recent progress in the studies of quantum gases*", Centre
Emile Borel, Institut Henri Poincare, Paris

July 2007, "*Workshop on Theoretical and Mathematical Physics*", Euler Institute, St.
Petersburg

June 2007, "*Conference on Quantum Phenomena in Confined Dimensions*", ICTP,
Trieste

September 2007, "*NORDITA meeting on quantum fluids*", NORDITA, Stockholm

June 2008, *BEC 2008 Conference on Bose Einstein Condensation in cold atomic
systems*, Grenoble

June 2008, *The Landau Memorial Conference "Advances in Theoretical Physics"*,
Landau Institute, Chernogolovka

June 2008, workshop "*Quantum Phases and Excitations in Quantum Hall Systems*",
MPI PKS, Dresden

September 2008, 2nd INSTANS Summer Conference "*Exact Results in Low-Dimensional
Quantum Systems*", Firenze

Contributed talks:

August 2003, NATO Advanced Research Workshop, "*Theory of Quantum Transport
in Metallic and Hybrid Nanostructures*", St. Petersburg

March 2008, "*Quantum Transport and Nanophysics*", VIth Rencontres de Moriond,
La Thuile

Evaluation of applications for research funding:

2008 external referee for the Swiss National Science Foundation

2008 external referee for the Foundation for Polish Science

Assignments as outside expert:

2006: outside expert at the innovations competition launched by "Expert Ukraine"
magazine

List of publications

1. D.A. Gorokhov , R.A. Suris, V.V. Cheianov, Kinetics of the self-intersection of macromolecules in the Gaussian-chain model, *Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki (Sov. Phys. JETP)*, **109**(1), 183 (1996)
2. D.A. Gorokhov, R.A. Suris, V.V. Cheianov Electron-energy-loss spectroscopy of the C60 molecule *Phys. Lett. A* **223**, 116 (1996)
3. A.Yu. Alekseev, Vadim V. Cheianov, Jurg Froehlich, Comparing conductance quantization in quantum wires and quantum Hall systems, *Phys. Rev. B* **54**, R17320 (1996)
4. V. V. Cheianov, A. P. Dmitriev, V. Yu. Kachorovskii, Splitting of Landau levels of a 2D electron due to electron-phonon interactions, *Phys. Rev. B* **58**, 776 (1998)
5. Anton Yu. Alekseev, Vadim V. Cheianov, Jurg Froehlich,, Universality of equilibrium one-dimensional transport from gauge invariance, cond-mat/9706061
6. Anton Yu. Alekseev, Vadim V. Cheianov, On nonuniversal conductance quantization in high-quality quantum wires, *Phys. Rev. B* **57**, R6834 (1998)
7. Anton Yu. Alekseev, Vadim V. Cheianov, Jurg Froehlich, Universality of transport properties in equilibrium, the Goldstone theorem, and chiral anomaly, *Phys. Rev. Lett.* **81**, 3503(1998)
8. Anton Yu. Alekseev, Vadim V. Cheianov, A. P. Dmitriev, V. Yu. Kachorovskii, Tunneling Spectroscopy of Localized States near the Quantum Hall Edge, *JETP Lett.* **72**, 481 (2000)
9. V. Cheianov, P. Rodin and E. Schöll, Transverse coupling in bistable resonant-tunneling structures, *Phys. Rev. B* **62**, 9996 (2000)
10. H. Bruus, V. V. Cheianov, K. Flensberg, From mesoscopic magnetism to the anomalous 0.7 conductance plateau, cond-mat/0002338
11. Bruus H., Cheianov V., Flensberg K., The anomalous 0.5 and 0.7 conductance plateaus in quantum point contacts, *Physica E* **10**, 97 (2001)
12. D. N. Aristov, Vadim V. Cheianov, A. Luther, Optical conductivity of one-dimensional doped Hubbard-Mott insulator, *Phys. Rev. B* **66**, 073105 (2002)
13. V. Cheianov, A.P. Dmitriev, and V.Yu. Kachorovskii, Anomalous Negative Magnetoresistance Caused by Non-Markovian Effects, *Phys. Rev. B* **68**, 201304 (2003)
14. Vadim V. Cheianov and M.B. Zvonarev, Non-unitary spin-charge separation in one-dimensional fermion gas, *Phys. Rev. Lett.* **92**,176401 (2004)
15. Vadim V. Cheianov and M.B. Zvonarev, Zero temperature correlation functions for the impenetrable fermion gas, *J.Phys.A* **37**, 2261 (2004)
16. Alexey Boyarsky, Vadim V. Cheianov, Oleg Ruchayskiy, Microscopic construction of the chiral Luttinger liquid theory of the quantum Hall edge, *Phys. Rev. B* **70**, 235309 (2004)
17. Vadim V. Cheianov, A.P. Dmitriev, V.Yu. Kachorovskii Non-Markovian Effects on the Two-Dimensional Magnetotransport: Low-field Anomaly in Magnetoresistance, *Phys. Rev. B* **70**, 245307 (2004)
18. Vadim V. Cheianov, H. Smith and M.B. Zvonarev, Low-temperature crossover in the momentum distribution of cold atomic gases in one dimension, *Phys.Rev. A* **71**, 033610 (2005)
19. Alexey Boyarsky, Vadim V. Cheianov, Oleg Ruchayskiy, Fermions in the harmonic potential and string theory, *JHEP* 0501 (2005) 010

20. Vadim V. Cheianov, H. Smith and M.B. Zvonarev Exact Results for Three-Body Correlations in a Degenerate One-Dimensional Bose Gas, *Phys. Rev. A* **73**, 051604(R) (2006)
21. Vadim V. Cheianov, H. Smith and M.B. Zvonarev, Three-body local correlation function in the Lieb-Liniger model: bosonization approach, *J. Stat. Mech.* (2006) P08015
22. Vadim V. Cheianov, Vladimir I. Fal'ko, Selective transmission of Dirac electrons and ballistic magnetoresistance of n - p junctions in graphene, *Phys. Rev. B* **74**, 041403 (2006)
23. Vadim V. Cheianov, Vladimir I. Fal'ko, Friedel oscillations, impurity scattering and temperature dependence of resistivity in graphene, *Phys. Rev. Lett.* **97**, 226801 (2006)
24. Vadim V. Cheianov, Vladimir I. Fal'ko, Boris L. Altshuler, and Igor L. Aleiner, Random Resistor Network Model of Minimal Conductivity in Graphene, *Phys. Rev. Lett.* **99**, 176801 (2007)
25. Vadim V. Cheianov, Eugene Sukhorukov, Resonant dephasing of the electronic Mach-Zehnder interferometer, *Phys. Rev. Lett.* **99**, 156801 (2007)
26. Vadim V. Cheianov, Vladimir Fal'ko, B.L. Altshuler, Veselago Lens for Electrons: Focusing and Caustics in Graphene p - n Junctions, *Science*, **315**, p 1252 (2007)
27. Vadim V. Cheianov, T. Giamarchi, M. Zvonarev, Spin Dynamics in a One-Dimensional Ferromagnetic Bose Gas, *Phys. Rev. Lett.* **99**, 240404 (2007)
28. V.V. Cheianov, M. Pustilnik, Threshold Singularities in the Dynamic Response of Gapless Integrable Models, *Phys. Rev. Lett.* **100**, 126403 (2008)
29. Vadim V Cheianov and M B Zvonarev, One-particle equal time correlation function for the spin-incoherent infinite U Hubbard chain, *J. Phys. A* **41**, 045002 (2008)
30. Vadim V. Cheianov, T. Giamarchi, M. Zvonarev, "Spin dynamics in the doped Bose-Hubbard insulator", *arXiv:0811.2676*