1   Curriculum Vitae

Alexander Minakov

Birthday:	12.05.1986
Nationality:	Ukrainian
Civil status:	Married
Degree:	PhD (Specialisation in Mathematical Physics)

RESEARCH INTERESTS

My research is/was focused on **long-time asymptotic analysis** of **initial value problems with step-like initial data** for different partial differential equations (**modified Korteweg - de Vries equation**, **Camassa - Holm equation**, **nonlinear Schrödinger equation**, **Korteweg - de Vries equation**), on **direct and inverse scattering transforms** for non-decreasing and increasing potentials. The main tools used are **Riemann - Hilbert problems**, **vanishing lemma** and **Deift - Zhou steepest descent method**. Recently, I started working in the area of **Orthogonal Polynomials** and **random matrices.**

EDUCATION

March 2013	**PhD in mathematics (Candidate of sciences)**, B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine. Advisor Prof. **Vladimir Kotlyarov.** *Title: "Riemann-Hilbert problems and modified Korteweg - de Vries equation: asymptotic analysis of solutions with initial data of step type".*
2007–2008	**MSc in Mathematics (with honor):** V. Karazin Kharkiv National University, School of Mathematics and Mechanics, Kharkiv, Ukraine.
2003–2007	**BSc in Mathematics:** V. Karazin Kharkiv National University, School of Mathematics and Mechanics, Kharkiv, Ukraine.

PROFESSIONNAL CAREER

Oct 2018 – present.	Postdoctoral researcher at the **Université catholique de Louvain**, Louvain-la-Neuve, Belgium. Host researcher: Professor Tom Claeys.
Nov 2015 – Sep 2018.	Postdoctoral researcher at the **International School for Advanced Studies (SISSA)**, Trieste, Italy. Host researcher: Professor Boris Dubrovin.
May 2013 – Oct 2015.	Postdoctoral researcher at the **Czech Technical University in Prague**, Děčín. Host researcher: Professor Pavel Exner.
Nov 2011 – May 2013.	Junior researcher at **the mathematical division of the B.Verkin Institute for Low Temperature Physics and Engineering** of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine.

LANGUAGES

English, Czech, Ukrainian (mother tongue).

COMPUTER SKILLS

Mathematica, MatLab, Python, R, C, C++, Java.

2   Research activities

PREPRINTS

2019 Boris Dubrovin, Alexander Minakov, *On a class of compact perturbations of the special pole-free joint solution of KdV and P_I^2.* arXiv:1901.07470

PUBLISHED ARTICLES

The publications are grouped according to their topic.

Nonlinear Schrödinger equation

2019 Vladimir Kotlyarov, Alexander Minakov, *Dispersive Shock Wave, Generalized Laguerre Polynomials and Asymptotic Solitons of the Focusing Nonlinear Schrödinger Equation.* Journal of Mathematical Physics 60, 123501 (2019) arXiv:1905.02493   doi:10.1063/1.5096896

Stimulated Raman Scattering

2018 Rustem R. Aydagulov, Alexander A. Minakov, *Initial-Boundary Value Problem for Stimulated Raman Scattering Model: Solvability of Whitham Type System of Equations Arising in Long-Time Asymptotic Analysis,* SIGMA 14 (2018), 119, 19 pages
doi:10.3842/SIGMA.2018.119   arXiv:1805.05153

Classical groups

2021 Tom Claeys, Gabriel Glesner, Alexander Minakov, Meng Yang, *Asymptotics for Averages over Classical Orthogonal Ensembles,* International Mathematics Research Notices, rnaa354, doi:10.1093/imrn/rnaa354

Camassa-Holm equation

2016 Alexander Minakov, *Asymptotics of step-like solutions for the Camassa-Holm equation,* Journal of Differential Equations, Volume 261, Issue 11, 2016, Pages 6055-6098.
doi:10.1016/j.jde.2016.08.028   arXiv:1512.04762

2015 A. Minakov, *Riemann-Hilbert problem for Camassa–Holm equation with step-like initial data,* Journal of Mathematical Analysis and Applications, 2015, Vol. 429, 81–104.
doi:10.1016/j.jmaa.2015.03.059   arXiv:1401.6777

Quantum waveguides

2014 P. Exner, A. Minakov, *Curvature-induced bound states in Robin waveguides and their asymptotical properties,* Journal of Mathematical Physics, 2014, Vol. 55, 122101.
doi:10.1063/1.4903184   arXiv:1406.7624

2014 P. Exner, A. Minakov, and L. Parnovski, *Asymptotic eigenvalue estimates for a Robin problem with a large parameter,* Portugal. Math., 2014, Vol. 71, N2, 141–156.
doi:10.4171/PM/1945   arXiv:1312.7293

Modified Korteweg-de Vries equation

2020 Tamara Grava, Alexander Minakov, *On the long time asymptotic of the modified Korteweg de Vries equation with step-like initial data.* SIAM J. Math. Anal. 52 (2020), no. 6, 5892–5993. arXiv:1907.11859

2019 Marco Bertola and Alexander Minakov, *Laguerre polynomials and transitional asymptotics of the modified Korteweg-de Vries equation for step-like initial data,* Analysis and Mathematical Physics, 9:1761, 2019. doi:10.1007/s13324-018-0273-1   arXiv:1711.02362

2015 V. Kotlyarov and A. Minakov, *Modulated elliptic wave and asymptotic solitons in a shock problem to the modified Korteweg-de Vries equation,* J. Phys. A 48 (2015), no. 30, 305201, 35 pp. doi:10.1088/1751-8113/48/30/305201   arXiv: 1304.1703

2012 V. Kotlyarov and A. Minakov, *Riemann–Hilbert problems and the mKdV equation with step initial data: short time behavior of solutions and the nonlinear Gibbs-type phenomenon,* J.Phys.A.: Math. Theor., 2012, Vol. 45, 325201, 17 p. doi:10.1088/1751-8113/45/32/325201

2012 V. Kotlyarov and A. Minakov, *Step-initial function to the mkdv equation: hyper-elliptic long-time asymptotics of the solution,* Journal of mathematical physics, analysis, geometry, 2012, Vol. 8, N1, P. 38–62. http://www.mathnet.ru/links/fd82fc5b40799ebb1df608c94a0e34f0/jmag524.pdf

2011 A. Minakov, *Long-time behavior of the solution to the mKdV equation with step-like initial data,* J.Phys.A.: Math. Theor., 2011, Vol. 44, 085206, 31 p. doi:10.1088/1751-8113/44/8/085206

2011 A. Minakov, *Asymptotics of rarefaction wave solution to the mKdV equation,* Journal of mathematical physics, analysis, geometry, 2011, Vol. 7, N1, P. 59–86. http://www.mathnet.ru/links/1c124addab6ef4524dbc0083b48bdb15/jmag166.pdf

2010 V. Kotlyarov and A. Minakov, *Riemann–Hilbert problem to the modified Korteveg - de Vries equation: Long-time dynamics of the steplike initial data,* Journal of Mathematical Physics, 2010, Vol. 51, 093056. doi:10.1063/1.3470505   arXiv: 1303.2455

PARTICIPATION IN SCIENTIFIC PROJECTS

2018 – 2020	Member of the project PRIMA - Partners in Research on Integrable models and Applications. https://sites.uclouvain.be/eos-prima/
2018 – 2019	Member of the European project Horizon2020 MSCA RISE 778010 (Research and Innovation Staff Exchange, Actions Marie Skłodowska-Curie) "Integrable Partial Differential Equations: Geometry, Asymptotics, and Numerics" (IPaDEGAN) https://ipadegan.unimib.it/en/partners/
2013 – 2015	Member of the project OPVK "Support of inter-sectoral mobility and quality enhancement of research teams at Czech Technical University in Prague", CZ.1.07/2.3.00/30.0034, sponsored by the European Social Fund in the Czech Republic.

OTHERS

2018–2020	PRIMA postdoctoral fellowship – Partners in Research on Integrable models and Applications (Université Catholique de Louvain, Louvain-la-Neuve, Belgium) https://sites.uclouvain.be/eos-prima/
2015–2018	SISSA postdoctoral fellowship (International School for Advanced Studies, Trieste, Italy).
2012	scholarship of the National Academy of Sciences of Ukraine for young scientists.
2010	scholarship of the Naum Akhiezer foundation. https://ilt.kharkov.ua/bvi/info/akhiezer_fond/akhiezer_fond_stipendiati_e.htm
2003	First degree diploma at the Kharkiv Mathematical Olympiad.

RESEARCH VISITS

Feb 13–16, 2020	University of Vienna, Austria. Host researcher: Johanna Michor.
Dec 25 – Jan 5, 2019	SISSA, Trieste, Italy. Host researcher: Tamara Grava.
Jan 18 – Feb 21, 2018	Concordia University, Montreal, Canada. Host researcher: Marco Bertola.
June 16–30, 2015	University of Stuttgart, Germany. Host researcher: Timo Weidl.
Feb 16–28, 2015	University of Stuttgart, Germany. Host researcher: Timo Weidl.

SEMINAR TALKS AND PARTICIPATION AT CONFERENCES

39. Conference "HYDW08 : New horizons in dispersive hydrodynamics", Isaac Newton Institute for Mathematical Sciences, Monday 21 June – Friday 2 July, **2021**.

38. Conference "Asymptotic methods in mathematical physics", dedicated to the memory of V.S.Buslaev, June 20-22, **2021.**

37. Seminar at the University of Vienna, Vienna, Austria, February 13, **2020**.

36. School and Workshop "Random Matrix Theory and Point Processes" (smr 3382) ICTP, Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, September 23–27, **2019**.

35. Conference "Classical and Quantum Integrability 2019", Institute of Mathematics of Burgundy, Dijon, France, September 2–6, **2019**.

34. Summer School "Randomness in Physics & Mathematics", ZIF, Center for Interdisciplinary research, Bielefeld, Germany, August 12–24, **2019**.

33. Seminar at B.Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine, July 16, **2019**.

32. Workshop "Integrability and Nonlinear Dispersive Equations" , CIRM, Marseille, Luminy, France, June 24 – 28, **2019** (talk).

31. Seminar at the Czech Technical University in Prague "On a class of unbounded solutions of the Korteweg-de Vries equation", May 14, **2019**.

30. Conference "Integrability and Randomness in Mathematical Physics and Geometry", CIRM, Marseille, Luminy, France, April 8–12, **2019** (poster).

29. Research School "Coulomb Gas, Integrability and Painlevé Equations", CIRM, Marseille, Luminy, France, March, 11–15 **2019** (poster).

28. Workshop "XIV Brunel – Bielefeld Workshop on RMT", December 14–15, **2018** (poster)

27. Geometry and Mathematical Physics seminar at the Université catholique de Louvain, October 18, **2018**.

26. Geometry and Mathematical Physics seminar at the Université catholique de Louvain, title: *"Laguerre polynomials and transitional asymptotics of the modified Korteweg-de Vries equation for step-like initial data"*, March 7, **2018**.

25. V International Conference "Analysis and Mathematical Physics", Kharkiv, Ukraine, 19–24 juin, **2018** (talk).

24. Workshop "Critical Phenomena for Random Matrices and Integrable Systems", Chateau de Limelette, Belgium, June 14–15, **2017** (poster).

23. French-American conference "Nonlinear Dispersive PDEs", Marseille, France, June 12–16, **2017** (poster).

22. Workshop "Asymptotic and computational aspects of complex differential equations", Pisa, Italy, February 13–17, **2017** (talk).

21. 27th Nordic Congress of Mathematicians, Celebration of the 100th Anniversary of the Mittag-Leffler Institute, Stockholm, Sweden, March 16–20, **2016** (talk).

20. Introductory workshop "Randomness and long time dynamics in nonlinear evolution differential equations at MSRI", Berkeley, Californie, USA, August 24–28, **2015**, attendance.

19. School "DC summer grad school in PDE", George Washington University, Washington DC, USA, July 26–31, **2015**, attendance.

18. Workshop "Asymptotics in Integrable Systems, Random Matrices and Random Processes and Universality: In honor of Percy Deift's 70th birthday", Montreal, Canada, June 7–11, **2015** (poster).

17. Workshop "Computational complex analysis for free surface flows and other applications", London, Great Britain, April 20–22, **2015** (poster).

16. Conference "Partial Differential Equations" München, Germany, March 25–30, **2015** (talk).

15. Workshop "Modern Applications of Complex Variables: Modeling, Theory and Computation (15w5052)", Banff, Canada, January 12–16, **2015** (talk).

14. 7th international conference "Differential and Functional Differential Equations", Moscow, Russia, August 22–29, **2014** (talk).

13. Workshop "Second Děčín Physics Day", Děčín, Czech republic, June 20, **2014** (talk).

12. Conference "Partial Differential Equations", Novacella, Italy, May 28 – June 3, **2014** (talk).

11. Mathematical Physics Seminar, University of Vienna, Vienna, Austria, March **2014**.

10. Seminar of the Department of Mathematics and Physics, University of Stuttgart, Stuttgart, Germany, February **2014**.

9. Workshop "First Děčín Physics Day", Děčín, Czech Republic, December 9, **2013**.

8. Crimean International Mathematical Conference, Sudak, Ukraine, September 9 – October 4, **2013**.

7. Conference QMATH12 "Mathematical Results in Quantum Mechanics", Berlin, Germany, September 10–13, **2013** (talk).

6. Conference EQUADIFF 2013, Prague, Czech Republic, August 26–30, **2013** (talk).

5. Conference "Symmetries of Discrete Systems and Processes", Děčín, Czech Republic, July 15–19, **2013** (talk).

4. International conference in honor of the 90th anniversary of Vladimir A. Marchenko "Spectral Theory and Differential Equations", Kharkiv, Ukraine, August 20–24, **2012** (talk).

3. 6th European Mathematics Congress, Krakow, Poland, July 2–7, **2012** (poster).

2. Conference "Completely Integrable Systems and Applications" - ESF-EMS-ERCOM, Vienna, Austria, July 3–8, **2011** (talk).

1. "XII International Scientific Krawtchouk Conference", Kyiv, Ukraine, May 15–17, **2008** (talk).