Dr. Vladimir Lotoreichik

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Nuclear Physics Institute
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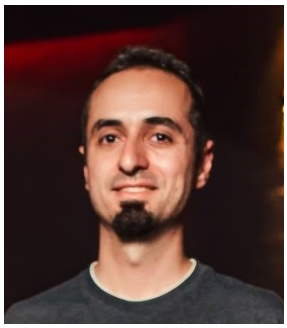

Personal data

Date of birth: 10 January 1985

Place of birth: Leningrad, USSR

Citizenship: Russian Federation

Research interests

- ⋆ Spectral theory
- ⋆ Shape optimization
- ⋆ Mathematical physics
- ⋆ Partial differential equations
- ⋆ Spectral geometry
- ⋆ Non-selfadjoint operators

Academic career

Nuclear Physics Institute, CAS — Czech Republic
Research fellow — 04/2017 – present

Nuclear Physics Institute, CAS — Czech Republic
Postdoc — 04/2015 – 03/2017

Graz University of Technology — Austria
Postdoc — 04/2013 – 03/2015

Graz University of Technology — Austria
PhD in Mathematics — 06/2011 – 12/2012

- PhD thesis supervisor: Prof. Dr. Jussi Behrndt
- 3 Dec 2012: PhD defence

– Thesis title: *Singular values and trace formulae for resolvent power differences of self-adjoint elliptic operators*

ITMO University Russia
Postgraduate studies in Mathematical Physics 07/2008- 06/2011

ITMO University Russia
M.Sc. in Applied Mathematics and Informatics 09/2002 - 06/2008

– Master thesis supervisor: Prof. Dr. Igor Yu. Popov

PUBLICATIONS AND PREPRINTS

[1] P. Exner, S. Kondej, and V. Lotoreichik, Asymptotics of the bound state induced by δ-interaction supported on a weakly deformed plane, *submitted*, arXiv:1703.10854.

[2] P. Exner, V. Lotoreichik, and A. Pérez-Obiol, On the bound states of magnetic Laplacians on wedges, *submitted*, arXiv:1703.03667.

[3] M. Holzmann and V. Lotoreichik, Spectral analysis of photonic crystals made of thin rods, *submitted*, arXiv:1701.05107.

[4] D. Krejčiřik and V. Lotoreichik, Optimisation of the lowest Robin eigenvalue in the exterior of a compact set, II: non-convex domains and higher dimensions, *submitted*, arXiv:1707.02269.

[5] V. Lotoreichik, Spectral isoperimetric inequalities for δ-interactions on open arcs and for the Robin Laplacian on planes with slits, *submitted*, arXiv:1609.07598.

[6] J. Behrndt, P. Exner, M. Holzmann, and V. Lotoreichik, On the spectral properties of Dirac operators with electrostatic δ-shell interactions, *to appear in J. Math. Pures Appl.*, arXiv:1609.00608.

[7] D. Krejčiřík and V. Lotoreichik, Optimisation of the lowest Robin eigenvalue in the exterior of a compact set, *to appear in J. Convex Anal.*, arXiv:1608.04896.

[8] D. Krejčiřík and V. Lotoreichik, and T. Ourmières-Bonafos, Spectral transitions for Aharonov-Bohm Laplacians on conical layers, *to appear in Proc. Roy. Soc. Edinburgh Sect. A.*, arXiv:1607.02454.

[9] J. Behrndt, P. Exner, M. Holzmann, and V. Lotoreichik, Approximation of Schrödinger operators with δ-interactions supported on hypersurfaces, *Math. Nachr.* **290** (2017), 1215–1248.

[10] J. Behrndt, R. L. Frank, C. Kühn, V. Lotoreichik, and J. Rohleder, Spectral theory for Schrödinger operators with δ-interactions supported on curves in $\mathbb{R}^3$, *Ann. Henri Poincaré* **18** (2017), 1305–1347.

[11] J. Behrndt, M. Langer, V. Lotoreichik, and J. Rohleder, Quasi boundary triples and semibounded self-adjoint extensions, *Proc. Roy. Soc. Edinburgh Sect. A.* **147** (2017), 895–916.

[12] V. Lotoreichik and J. Rohleder, Eigenvalue inequalities for the Laplacian with mixed boundary conditions, *J. Differential Equations* **263** (2017), 491–508.

[13] P. Exner and V. Lotoreichik, A spectral isoperimetric inequality for cones, *Lett. Math. Phys.* **107** (2017), 717–732.

[14] P. Exner, V. Lotoreichik, and M. Tater, Spectral and resonance properties of the Smilansky Hamiltonian, *Phys. Lett. A.* **381** (2017), 756–761.

[15] V. Lotoreichik and P. Siegl, Spectra of definite type in waveguide models, *Proc. Amer. Math. Soc.* **145** (2017), 1231–1246.

[16] M. Jex and V. Lotoreichik, On absence of bound states for weakly attractive δ′-interactions supported on non-closed curves in $\mathbb{R}^2$, *J. Math. Phys.* **57** (2016), 022101.

[17] V. Lotoreichik and T. Ourmières-Bonafos, On the bound states of Schrödinger operators with δ-interactions on conical surfaces, *Comm. Partial Differential Equations* **41** (2016), 999–1028.

[18] J. Behrndt, G. Grubb, M. Langer, and V. Lotoreichik, Spectral asymptotics for resolvent differences of elliptic operators with δ and δ′-interactions on hypersurfaces, *J. Spectr. Theory.* **5** (2015), 697–729.

[19] J. Behrndt, P. Exner, and V. Lotoreichik, Schrödinger operators with δ-interactions supported on conical surfaces, *J. Phys. A: Math. Theor.* **47** (2014), 355202, 16 pp.

[20] J. Behrndt, P. Exner, and V. Lotoreichik, Schrödinger operators with δ and δ′-interactions on Lipschitz surfaces and chromatic numbers of associated partitions, *Rev. Math. Phys.* **26** (2014), 1450015, 43 pp.

[21] V. Lotoreichik, Lower bounds on the norms of extension operators for Lipschitz domains, *Oper. Matrices* **8** (2014), 573–592.

[22] S. Kondej and V. Lotoreichik, Weakly coupled bound state of 2-D Schrödinger operator with potential-measure, *J. Math. Anal. Appl.* **420** (2014), 1416–1438.

[23] V. Lotoreichik and S. Simonov, Spectral analysis of the half-line Kronig-Penney model with Wigner-von Neumann perturbations, *Rep. Math. Phys.* **74** (2014), 45–72.

[24] J. Behrndt, M. Langer, and V. Lotoreichik, Trace formulae and singular values of resolvent power differences of self-adjoint elliptic operators, *J. London. Math. Soc. (2)* **88** (2013), 319–337.

[25] J. Behrndt, M. Langer, and V. Lotoreichik, Spectral estimates for resolvent differences of self-adjoint elliptic operators, *Integral Equations and Operator Theory* **77** (2013), 1–37.

[26] J. Behrndt, M. Langer, and V. Lotoreichik, Schrödinger operators with δ and δ′-potentials supported on hypersurfaces, *Ann. Henri Poincaré* **14** (2013), 385–423.

[27] V. Lotoreichik, Singular continuous spectrum of half-line Schrödinger operators with point interactions on a sparse set, *Opuscula Math.* **31** (2011), 615–628.

[28] J. Behrndt, M. Langer, I. Lobanov, V. Lotoreichik, and I. Yu. Popov, A remark on Schatten-von Neumann properties of resolvent differences of generalized Robin Laplacians on bounded domains, *J. Math. Anal. Appl.* **371** (2010), 750–758.

[29] I. Lobanov, V. Lotoreichik, and I. Yu. Popov, Lower bound on the spectrum of the two-dimensional Schrödinger operator with a delta-perturbation on a curve, *Theor. Math. Phys.* **162** (2010), 332–340.

CONTRIBUTIONS TO SPECIAL VOLUMES AND MONOGRAPHS (PEER REVIEWED)

[1] J. Behrndt, M. Langer, and V. Lotoreichik, Trace formulae for Schrödinger operators with singular interactions, *The Pavel Exner Anniversary Volume, EMS* (2017), 129–152.

[2] P. Exner and V. Lotoreichik, Optimization of the lowest eigenvalue for leaky star graphs, *submitted*, arXiv:1701.06840.

[3] P. Exner, V. Lotoreichik, and M. Tater, On resonances and bound states of Smilansky Hamiltonian, *Nanosystems: Physics, Chemistry, Mathematics* **7** (2016), 789–802 *(the volume devoted to the memory of B. S. Pavlov (1936–2016).*

[4] V. Lotoreichik, H. Neidhardt, and I. Yu. Popov, Point contacts and boundary triples, in: *Mathematical Results in Quantum Mechanics, Proceedings of the QMath12 Conference, P. Exner, W. König, and H. Neidhardt (eds)*, World Scientific, Singapore, 2015, pp. 283–293.

[5] J. Lipovský and V. Lotoreichik, Asymptotics of resonances induced by point interactions, *submitted*, arXiv:1708.03509.

[6] V. Lotoreichik and J. Rohleder, An eigenvalue inequality for Schrödinger operators with δ and δ′-interactions supported on hypersurfaces, *Oper. Theory Adv. Appl.* **247** (2015), 173–184.

GRANTS AND FELLOWSHIPS

2017 - present: co-recipient of the grant 17-01706S of the Czech Science Foundation (GAČR).

01/2017 - present: co-recipient of the cooperation project N. 017022 between Czech Academy of Sciences and TU Graz.

11/2016 - 12/2016: recipient of the travelling fellowship ISR-16-37 of Czech Academy of Sciences for collaboration with Technion (Haifa).

2015 - 2016: co-recipient of the grant 14-06818S of the Czech Science Foundation (GAČR).

01/2015 - 12/2016: co-operation partner in the project 2013/11/B/ST1/03067 of Polish National Science Center.

04/2013 - 03/2015: co-recipient of the grant 25162-N26 of Austrian Science Fund (FWF).

01/2013 - 12/2014: co-recipient of the cooperation project CZ01/2013 between TU Graz and Czech Academy of Sciences.

01/2010 - 12/2011: co-recipient of the grant NK-526P/24 of the program "Scientific stuff of innovative Russia".

01/2010 - 12/2010: recipient of the scholarship 50077360 of Leonard Euler Program (DAAD).

01/2009 - 12/2010: co-recipient of the grant 2.1.1/4215 of the program "Development of the potential of Universities in Russia".

01/2009 - 12/2009: recipient of the grant 2.1/30-04/035 of the government of St. Petersburg.

CONFERENCES

25 - 29 Sep, 2017: Aspect17: Asymptotic analysis and spectral theory, Trier, Germany.

10 - 15 Sep, 2017: The 5th Najman conference on spectral theory and differential equations, Opatija, Croatia.

5 - 9 Jun, 2017: Mathematical aspects of the physics with non-self-adjoint operators, Luminny, France.

19 - 20 May, 2017: Workshop of the GAMM activity group applied operator theory, Hamburg, Germany.

24 - 28 Apr, 2016: Schrödinger operators and boundary value problems, Graz, Austria.

17 - 20 Dec, 2016: Operator theory and indefinite inner product spaces, Vienna, Austria.

7 - 10 Nov, 2016: Mathematical challenges of zero-range physics: rigorous results and open problems, Trieste, Italy.

14 - 15 Jul, 2016: New methods in extension theory applied to quantum mechanics, Berlin, Germany.

4 - 6 Apr, 2016: Geometric aspects of spectral theory, Bilbao, Spain.

28 - 30 Oct, 2015: Young researchers workshop on spectral theory, Bern, Switzerland.

26 - 30 May, 2015: Spectral theory and applications, Krakow, Poland.

4 - 10 Jan, 2015: Spectral theory and Weyl function, Oberwolfach, Germany.

30 Nov - 6 Dec, 2014: Eigenvalues problems in superconductivity, Oberwolfach, Germany.

14 - 18 Jul, 2014: IWOTA 2014, Amsterdam, Netherlands.

2 - 6 Jun, 2014: Modern aspects of the Titchmarsh-Weyl m-function and its multidimensional analogues, Mittag-Leffler Center, Stockholm, Sweden.

16 - 20 Sep, 2013: The 3rd Najman conference on spectral problems for operators and matrices, Biograd, Croatia.

10 - 13 Sep, 2013: QMath12, Berlin, Germany.

2 - 6 Jul, 2013: The 5th St. Petersburg conference in spectral theory, St. Petersburg, Russia.

18 - 22 Feb, 2013: System and operator realizations of analytic functions, Lorentz Center, Leiden, Netherlands.

26 - 30 Mar, 2012: The 83rd Annual Meeting of the international association of applied mathematics and mechanics, Darmstadt, Germany.

Sep, 2011: Inverse Problems Program at Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom.

30 May - 3 Jun, 2011: Days on Diffraction 2011, St. Petersburg, Russia.

14 - 17 Dec, 2010: Workshop on systems and operators, Groningen, Netherlands.

6 - 10 Sep, 2010: QMath11, Hradec Kralove, Czech Republic.

12 - 16 Jul, 2010, IWOTA 2010, Berlin, Germany.

8 - 11 Jun, 2010: Days on Diffraction 2010, St. Petersburg, Russia.

14 - 18 Dec, 2009: Boundary relations, Lorentz Center, Leiden, Netherlands.

18 - 21 Nov, 2009: Spectral problems and related questions, Moscow, Russia.

20 - 26 May, 2009: Days on Diffraction 2009, St. Petersburg, Russia.

30 Mar - 2 Apr, 2009: Modern problems of mathematics, mechanics and their applications, Moscow, Russia.

16 - 21 Feb, 2009: Third School and Workshop on Mathematical Methods in Quantum Mechanics, Bressanone, Italy.

18 - 21 Dec, 2008 8th Workshop operator Theory in Krein Spaces and inverse Problems, Berlin, Germany.

RESEARCH VISITS

04/2017: Jussi Behrndt, TU Graz, Austria.

11/2016: Ram Band, Technion Haifa, Israel.

04/2016: Jiři Lipovský, University of Hradec Kralove, Czech Republic.

02/2016: Sylwia Kondej, University of Zielona Gora, Poland.

05/2015: Thomas Ourmiéres-Bonafos, BCAM, Bilbao, Spain.

11/2014: Andrii Khrabustovkyi, TU Karlsruhe.

05/2014: Pavel Exner, Doppler Institute, Prague.

08/2014: Pavel Exner, Doppler Institute, Prague.

01/2013: Hagen Neidhardt, WIAS, Berlin.

01/2013: Sylwia Kondej, University of Zielona Gora, Poland.

12/2011: Harald Woracek and Sergey Simonov, Vienna University of Technology.

05/2011: Matthias Langer, Strathclyde University, Glasgow.

12/2010: Jussi Behrndt, TU Berlin.

10/2010: Andrey Shkalikov, Moscow State University.

07/2010: Jussi Behrndt, TU Berlin.

07/2010: Johannes Brasche, TU Clausthal, Germany.

07/2009: Jussi Behrndt, TU Berlin.

TEACHING EXPERIENCE

Lecturer — Graz University of Technology
Lecture on Partial Differential Equations — Winter 2014

Lecturer — Graz University of Technology
Lecture on Schrödinger operators — Spring 2013

Assistant — Graz University of Technology
Exercises in Calculus of Variations — Spring 2012 and 2014

Assistant — ITMO University
Exercises in Analysis — 2009 - 2011

Assistant — ITMO University
Exercises in Mathematics for Engineers — Spring 2009

Assistant — ITMO University
Exercises in Informatics — 2008 - 2010

Assistant — ITMO University
Lecture on Informatics — Autumn 2008 and 2009

OTHER ACTIVITIES

- AMS Reviews.
- Referee for international mathematical journals.
- Involved in the seminar on modern mathematics at Czech Technical University.
- Co-organisation of the mini-workshop *Schrödinger operators with* δ*-interactions on manifolds*, TU Graz, 2013.
- Co-supervised Master and Bachelor Theses of Markus Holzmann.
- Participation in programming contests (2001 – 2003).

- Development of tools for simulation of light propagation at Keldysh Institute of Applied Mathematics (Moscow) (2006 - 2008).
- Awards in competitions for students of technical universities, including:
  - *the 1st place* in St. Petersburg Mathematics Olympiad 2003,
  - *the 2nd place* in St. Petersburg Physics Olympiad 2002.

COMPUTER SKILLS

- Experienced user of LaTeX
- SageMath
- Basics of web design
- Octave and Mathematica
- Former experience in Java, C and C++
- Algorithms and data structures

LANGUAGES

- Russian - native
- English - fluent
- German - good
- Czech - good