

# Illia Karabash – Curriculum Vitae

Name: Illia M. Karabash (other spellings Illya M. Karabash, Ilia Karabach)  
Born: 30/04/1977, Ukraine  
Citizenship: Ukraine  
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## Languages

English (fluent), German (B1), Russian (native), Ukrainian (fluent)

## Scientific Interests

Applied Analysis, Optimization,  
Resonances and Wave Equations,  
Optimal Control, Hamilton-Jacobi-Bellman Equations,  
Topology Optimization, Pareto Optimization,  
Two-weight Inequalities for Hilbert and Cauchy Transforms  
Denoising, Random Fourier series,  
Waves in Random Media, Photoacoustic Tomography,  
Degenerate Parabolic PDE in Liquid Film Theory and Kinetic Theory,  
Nonlinear/Nonselfadjoint Spectral Problems,  
Stability for Delay Equations,

## Awards

1994, July Bronze Award at the 35-th International Mathematical Olympiad  
(Hong Kong, Member of the Ukrainian team)  
2000, April Diploma of the National Academy of Sciences of Ukraine for  
the best student scientific paper in Mathematics in 2000.  
2014, June The prize in the category "Highest experts rank" at the Humboldt Kolleg  
"Education and Science and their Role in Social and Industrial Progress of Society",  
Kyiv, Ukraine  
1992, 1994 2 diplomas of the First Degree  
at the Ukrainian National Mathematical Olympiad for juniors  
1993, 1995-98 5 diplomas of the second and third degrees  
at Ukrainian National Mathematical Olympiads for students and juniors

## Grants

2016-2018 VolkswagenStiftung Trilateral Partnership "Modeling, Analysis, and  
Approximation Theory toward applications in tomography  
and inverse problems" (250 000 €).  
Joint coordination with Jürgen Prestin.  
1994-1997 2 Soros's grants for students (ISSEP No.GSU051062, No.GSU071182)

## Education

15/12/2005 Candidate of Phys.-Math. Sc. (equivalent of Ph.D.)  
Institute of Applied Mathematics and Mechanics of NASU, Donetsk,  
(at Slovyans'k from January 2015), Ukraine  
Scientific Adviser: Mark M. Malamud  
06/1999 Diploma with honor in Mathematics, Donetsk State University, Donetsk, Ukraine  
(Vasyl' Stus Donetsk National University at Vinnitsa from September 2014)

## Professional Experience

01/2013-present Senior research fellow, Department of PDE,  
Institute of Applied Mathematics and Mechanics of NASU, Donetsk  
(at Slovyans'k from January 2015), Ukraine

08/2018-05/2019 Humboldt Experienced Researcher at Mathematical Institute of the University of Bonn, Alexander von Humboldt Foundation, Bonn, Germany

08/2017-12/2017 Humboldt Experienced Researcher at Mathematical Institute of the University of Bonn, Alexander von Humboldt Foundation, Bonn, Germany

11/2016-01/2017 Humboldt Experienced Researcher at Mathematical Institute of the University of Bonn, Alexander von Humboldt Foundation, Bonn, Germany

04/2006-12/2012 Research fellow, Junior research fellow,  
Institute of Applied Mathematics and Mechanics of NASU, Donetsk, Ukraine  
Head of the department: Andrey E. Shishkov

12/2002-08/2006 Assistant, Senior Lecturer, acting Docent,  
Mathematical Faculty, Donetsk National University, Donetsk, Ukraine  
Heads of the department : Roald M. Trigub, Vladimir A. Derkach

### **Long term visits and Postdoc Positions**

01/2017-04/2017 Hausdorff Research Institute for Mathematics, Bonn, Germany,  
participant of Trimester "Multiscale Problems: Algorithms, Numerical Analysis and Computation"

01/2016-04/2016 Hausdorff Research Institute for Mathematics, Bonn, Germany,  
participant of Trimester "Mathematics of Signal Processing"

08/2015-12/2015 Institute of Mathematics, Universität zu Lübeck, Germany

01/2015-04/2015 Institute of Mathematics, Universität zu Lübeck, Germany

08/2014-12/2014 Institute of Mathematics, Universität zu Lübeck, Germany

11/2008-10/2010 PIMS Post-doctoral Fellow, University of Calgary, Canada  
Supervisors:  
Elena Braverman (University of Calgary),  
Richard Froese (UBC, Vancouver)

08/2007-07/2008 Post-Doctoral Fellow, the University of Calgary, Canada

11/2006-04/2007 Post-Doktorand, the University of Zurich, Zurich, Switzerland  
Supervisor:  
Michel M. Chipot

### **Teaching Experience**

10/2018-present Instructor, the University of Bonn, Germany

08/2007-01/2008 Instructor, the University of Calgary, Calgary, Canada

12/2002-08/2006 Assistant, Senior Lecturer, acting Docent, Donetsk National University, Ukraine

09/1999-08/2000 Supervisor of a math Olympiad seminar for talented school students (part time),  
Specialized school no.35, Donetsk, Ukraine

Courses taught in English Geometric optimal control (lecture course),  
Ordinary Differential Equations (lecture course and tutorials)

Courses taught in Russian and Ukrainian Mathematical Analysis (tutorials), Functional Analysis (tutorials),  
Nevanlinna-functions and Sturm-Liouville Operators (lecture course),  
Extension theory for symmetric operators (lecture course),  
Hardy Spaces (lecture course),  
Supervisor of 2nd and 3rd year students with specialization in Analysis

### **Organization of Conferences**

7-10/06/2017 International Conference of Young Mathematicians  
dedicated to the 100th Anniversary of Yu. O. Mitropolskiy (1917–2008),  
Kyiv, Ukraine (Program Committee)

24-27/06/2016 Kick-Off Meeting of the project "Modeling, Analysis, and Approximation Theory  
toward applications in tomography and inverse problems", Lübeck, Germany (organizer)

19/02/2015 Workshop "Mathematical models in Photoacoustic Tomography",

Lübeck, Germany (organizer)

### **Seminar Talks**

- 28/05/2019 Seminar of Nonlinear PDE Group, Institut für Analysis,  
Karlsruher Institut für Technologie, Germany
- 26/04/2019 Oberseminar Nonlinear Analysis, Department of Mathematics  
and Computer Science, the University of Cologne, Germany
- 26/04/2019 Seminar of Functional Analysis Group,  
Institute for Applied Mathematics, the University of Bonn, Germany
- 9/04/2019 Seminar of Trimester Program "Evolution of Interfaces",  
Hausdorff Research Institute for Mathematics, the University of Bonn, Germany
- 15/03/2018 Kolloquium, Institute of Mathematics, Universität zu Lübeck, Germany
- 19/01/2018 Graduate Seminar on Advanced Topics in PDE, Mathematical Institute,  
the University of Bonn, Germany
- 11/04/2017 Seminar of Trimester Program "Multiscale Problems: Algorithms, Numerical  
Analysis and Computation", Hausdorff Research Institute for Mathematics,  
the University of Bonn, Germany
- 03/03/2017 Colloquium of Department of Mathematics and Statistics,  
Georgetown University, Georgetown, D.C., USA
- 12/01/2017 Oberseminar Analysis, Institut für Angewandte Mathematik,  
the University of Bonn, Germany
- 15/04/2016 Seminar of Hausdorff Trimester Program "Mathematics of Signal Processing",  
Hausdorff Research Institute for Mathematics, the University of Bonn, Germany
- 17/12/2015 Institute of Mathematics, Universität zu Lübeck, Germany
- 11/02/2015 Seminar "PDE, Inverse Problems, and Photoacoustic Tomography",  
the University of Lübeck, Germany
- 18/06/2014 Pidstryhach Institute for Applied Problems of Mechanics and Mathematics,  
NAS of Ukraine, Lviv, Ukraine
- 06/02/2014 Institute of Mathematics, Universität zu Lübeck, Germany
- 20/11/2013 Mathematical Division, Institute for Low Temperature Physics and Engineering,  
NAS of Ukraine, Kharkiv, Ukraine
- 09/10/2013 Department of Topology, Institute of Mathematics of NASU, Kiev, Ukraine
- 18/10/2012 Mathematical faculty, V.N. Karazin Kharkiv National University, Ukraine
- 23/11/2011 Department of Math Physics and Computational Math,  
V.N. Karazin Kharkiv National University, Ukraine
- 11/2011 Kiev Functional Analysis seminar, the Institute of Mathematics, Ukraine,
- 02/2010 POTSI/MITACS Talks in Analysis, University of Calgary, Canada
- 04/2008 POTSI/MITACS Talks in Analysis, University of Calgary, Canada
- 07/2007 Johann Radon Institute for Computational and Applied Mathematics (RICAM),  
Austrian Academy of Sciences, Linz, Austria
- 04/2006 Department of Mathematics, Humboldt-Universität zu Berlin, Germany
- 04/2006 Institut für Mathematik, Technische Universität Berlin, Germany
- 03/2005 Analysis Seminar of Institute of Mathematics, Kiev, Ukraine
- 11/2003 University of Vaasa, Finland
- 04/2000 Moscow State University, Moscow, Russia.

### **Plenary Conference Lectures and Invited Talks**

- 9-13/07/2018 3rd Workshop "Mathematical Challenges of Zero-Range Physics: rigorous results  
and open problems", INdAM, University of Rome "La Sapienza", Italy (invited talk)
- 31/7-4/8/2017 Summer School "Modeling, Analysis, and Approximation Theory  
toward applications in tomography and inverse problems",  
Universität zu Lübeck, Germany (plenary speaker)

- 20-23/06/2016 Symposium MOIMA 2016, “Mathematical Optics, Image Modelling and Algorithms 2016” Schloss Herrenhausen, Hannover, Germany (invited talk)
- 07-10/03/2016 AMMODIT and final EUMLS Workshop ”Mathematics for Life Sciences” Hotel Schloss Hasenwinkel, Bibow, Mecklenburg-Vorpommern, Germany (invited talk)
- 5-10/09/2013 2nd EUMLS Conference ”Mathematics for Life Sciences”, Olenivka, Crimea, Ukraine (invited talk)
- 4-6/06/2010 Canadian Mathematical Society Summer meeting, Fredericton, New Brunswick, Canada (invited session talk)
- 16-18/10/2009 Northwest Functional Analysis Seminar, BIRS, Banff, Canada (invited lecture)
- 13-16/12/2007 7th Workshop Operator Theory in Krein Spaces and Spectral Analysis, TU Berlin, Berlin, Germany (invited talk)
- 14-17/12/2006 6th Workshop Operator Theory in Krein Spaces and Operator Polynomials, TU Berlin, Berlin, Germany (invited talk)
- 16-18/12/2005 5th Workshop Operator Theory in Krein Spaces and Differential Equations, TU Berlin, Berlin, Germany (invited talk)
- 17-19/12/2004 4th Workshop Operator Theory in Krein Spaces and Applications, TU Berlin, Berlin, Germany (invited talk)
- Some of other Conference Presentations**
- 20-21/08/2018 “Workshop on Modeling, Analysis, and Approximation Theory Toward Applications in Tomography and Inverse Problems”, Humboldt-Universität zu Berlin, Germany (talk)
- 23–27/07/2018 Conference on Mathematics of Wave Phenomena, Karlsruhe Institute of Technology, Germany (minisymposium talk)
- 25-29/09/2017 3rd French-German meeting ”Asymptotic analysis and spectral theory” (Aspect17), Trier, Germany (talk)
- 24-27/06/2016 Kick-Off Meeting “ Modeling, Analysis, and Approximation Theory toward applications in tomography and inverse problems”, Lübeck, Germany (talk)
- 15-19/09/2015 The EUMLS conference “Mathematics for Life Sciences”, Rivne, Ukraine (talk)
- 19/02/2015 Workshop ”Mathematical models in Photoacoustic Tomography”, Lübeck, Germany (talk)
- 01-03/09/2014 Workshop ”Mathematical Signal Processing and Phase Retrieval”, Göttingen, Germany (talk)
- 9–14/09/2013 International Conference ”Nonlinear Partial Differential Equations” (NPDE–2013), Donetsk, Ukraine (talk)
- 17-21 /09/2012 International conference dedicated to the 120th anniversary of Stefan Banach, Lviv, Ukraine (talk)
- 25-30/06/2012 21st Summer St. Petersburg Meeting in Mathematical Analysis, Saint-Petersburg, Russia (talk)
- 20-23/06/2011 International conference in Modern Analysis, Donetsk, Ukraine (talk)
- 29/5–4/6/2011 The international conference ”Differential Equations and Related Topics” dedicated to I. G. Petrovskii (23-d meeting), Moscow, Russia (talk)
- 02-06/08/2010 International Workshop “Singular Diffusion and Evolving Interfaces” Hokkaido University, Sapporo, Japan (talk in the session for young researchers)
- 7-11/06/2010 Annual Canadian Operator Algebra and Operator Theory Symposium, Fredericton, New Brunswick, Canada (talk)
- 18-20/05/2010 7th Canadian Young Researchers Conference in Mathematics and Statistics, Edmonton, Canada (talk)
- 17-19/06/2009 6th Canadian Young Researchers Conference, Calgary, Canada (talk)
- 22-26/06/2008 The XIXth International Workshop on Operator Theory and its Applications (IWOTA 2008), Williamsburg, Virginia, USA (talk)

- 9-10/02/2008 PIMS-CRG Workshop in Geometry and Harmonic Analysis, Calgary, Canada (talk)  
 16-20/07/2007 6th International Congress on Industrial and Applied Mathematics (ICIAM 2007),  
 Zurich, Switzerland (talk)  
 27-31/03/2006 77th Annual Meeting of the Gesellschaft für Angewandte Mathematik  
 und Mechanik e.V. (GAMM 2006), Berlin, Germany (talk)  
 18-29/09/2005 16th Crimean Autumn Math. School-Symposium, Laspi, Ukraine (talk)  
 9-14/04/2001 International Conference "23d Conference of young scientists of mech.-math.  
 department of Moscow State University", Moscow, Russia (talk)  
 3-7/07/2000 Functional analysis Valencia 2000, Valencia, Spain (talk)  
 09/2000-2004 4 session talks on the annual International Conference "Crimean Autumn  
 Math. School-Symposium", Laspi, Ukraine

### Some of Attended Conferences

- 3-9/02/2019 MFO workshop "Nonlinear Evolution Equations: Analysis and Numerics",  
 Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach-Walke, Germany  
 01-04/2019 Trimester Program "Evolution of Interfaces",  
 Hausdorff Research Institute for Mathematics, Bonn, Germany  
 2-7/09/2018 Summer School: Unique continuation and inverse problems  
 Wolffhotel in Kopp (Vulkaneiffel), Germany  
 22-25/05/2018 Cologne Conference on Positivity and Differential Equations  
 Universität zu Köln, Germany  
 4-8/09/2017 Hausdorff School: Dispersive Equations, Solitons, and Blow-up  
 HCM, University of Bonn, Germany  
 19-23/06/2017 Arbeitstagung 2017 on "Physical Mathematics" in honor of Yuri Manin  
 Max-Planck-Institut für Mathematik, Bonn, Germany  
 3-7/04/2017 Workshop on Non-local Material Models and Concurrent Multiscale Methods,  
 Hausdorff Research Institute for Mathematics, Bonn, Germany  
 13-17/02/2017 Workshop on Numerical Inverse and Stochastic Homogenization,  
 Hausdorff Research Institute for Mathematics, Bonn, Germany  
 9-13/01/2017 Winter School on Numerical Analysis of Multiscale Problems,  
 Hausdorff Research Institute for Mathematics, Bonn, Germany  
 14-18/03/2016 Workshop "Singularity formation and long-time behavior in dispersive PDEs",  
 Mathematical Institute, University of Bonn, Germany  
 11-15/01/2016 Winter School on Advances in Mathematics of Signal Processing,  
 Hausdorff Research Institute for Mathematics, Bonn, Germany  
 21-23/10/2015 Panorama of Mathematics, the Hausdorff Center for Mathematics, Bonn, Germany  
 21-25/09/2015 Summer School on Applied Analysis 2015, TU Chemnitz, Germany  
 7-11/08/2014 The 10th Korean Conference in Several Complex Variables, Gyeong-Ju, Korea  
 18-29/06/2012 St. Petersburg School in Probability and Statistical Physics  
 the Chebyshev Laboratory at St. Petersburg State University, Russia  
 26-30/07/2010 Mathematical Aspects of Crystal Growth  
 Department of Mathematics, Hokkaido University, Sapporo, Japan  
 29/6-3/7/2009 PIMS/Accelerate Canada Summer School in PDE "Topics in Kinetic Theory",  
 Victoria, BC, Canada  
 21-26/06/2009 Theory and Applications of Classical and Quantum Kinetic Theory, BIRS,  
 Banff, Canada  
 30/3-4/4/2008 Workshop "Recent Developments in Elliptic and Degenerate Elliptic PDE,  
 Systems and Geometric Measure Theory", BIRS, Banff, Canada

### Short Visits

- 1/6-30/6/2015 Institute of Mathematics, Universität zu Lübeck, Germany  
 26/7-5/8/2014 Institute of Mathematics, Universität zu Lübeck, Germany

18/1-15/3/2014 Institute of Mathematics, Universität zu Lübeck, Germany  
09-10/2010 Dep. of Mathematics, University of British Columbia, Vancouver, Canada, 2 weeks  
12/7-13/8/2010 The minisemester on evolution of interfaces, Department of Mathematics,  
Hokkaido University, Sapporo, Japan  
04/2010 Dep. of Mathematics, University of British Columbia, Vancouver, Canada, 2 weeks  
09-10/2009 Dep. of Mathematics, University of British Columbia, Vancouver, Canada, 2 weeks  
07/2007 Johann Radon Institute for Computational and Applied Mathematics (RICAM),  
Austrian Academy of Sciences, Linz, Austria, 2 weeks  
04/2006 Dep. of Mathematics, Humboldt-Universität zu Berlin, Berlin, Germany, 1 week  
04/2006 Institut für Mathematik, Technische Universität Berlin, Germany, 1 weeks  
11/2003 Dep. of Mathematics and Statistics, University of Vaasa, Vaasa, Finland, 2 weeks

### **Scholarships and Travel Grants**

2014 NANUM 2014 Travel Grant for participation  
in the International Congress of Mathematicians 2014 (Seoul, Korea)  
2007 RICAM-ICIAM grant for participation in the international congress "the 6th  
International Congress on Industrial and Applied Mathematics (ICIAM 2007)"  
2006 Scholarship for participation in the international conference "77th Annual Meeting  
of the Gesellschaft für Angewandte Mathematik und Mechanik e.V. (GAMM 2006)"  
2001-2002 Two scholarships of President of Ukraine for PhD students  
1997 Scholarship of Cabinet of Ukraine for Talented Students

### **Other Activities**

02-03/2015 Organizer of the seminar "PDE, Inverse Problems, and Photoacoustic Tomography",  
the University of Lübeck  
2011-2014 Organizer of young scientists's weekly literature seminars on nonlinear PDE  
and stochastic ODE at the Institute of Applied Mathematics and Mechanics of NASU  
2001-2006 Organizer young scientists's weekly literature seminars  
in Analysis at Donetsk National University  
1995-97 Judge at the Ukrainian Regional Mathematical Competitions for Juniors