

Darya Apushkinskaya

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Personal

Date/place of birth	March 17, 1968, St. Petersburg, Russia
Nationality	Russian (Permanent resident of Germany)
Civil Status	married, 2 children
Languages	English, German, native Russian

Employment History

09/1991 - 09/1993	<u>Assistant Professor (part time).</u> St. Petersburg State University, St. Petersburg, Russia
10/1993 - 09/1996	<u>Assistant Professor,</u> St. Petersburg State University of Architecture and Civil Engineering, St. Petersburg, Russia
09/1996 - 01/1998	<u>Post-doc,</u> (Supervisor: Prof. Neil S. Trudinger) Australian National University, Canberra, Australia,
02/1998 - 12/2000	<u>Assistant Professor,</u> St. Petersburg State University of Architecture and Civil Engineering, St. Petersburg, Russia
01/2001 – 09/2015	<u>Assistant Professor,</u> AG Prof. Martin Fuchs, Saarland University, Saarbrücken, Germany
10/2015 – present	<u>Research Fellow,</u> AG Prof. Sergej Rjasanow, Saarland University, Saarbrücken, Germany

Education

1985 - 1990

M.S. (with Distinction), Mathematics

Leningrad State University, Leningrad, UdSSR

Thesis: "*An Estimate for the Maximum of Solutions of Parabolic Equations with the Venttsel' conditions*"

Supervisor: Prof. Nina N. Uraltseva

1990 - 1993

Ph. D., Mathematics

St. Petersburg State University, St. Petersburg, Russia

Ph. D. Thesis: "*Nonstationary Venttsel' Problem for Nonlinear Parabolic Equation*"

Supervisor: Prof. Nina N. Uraltseva

2013

Habilitation

Saarland University, Saarbrücken, Germany

Thesis: "*Free boundary problems – regularity properties near the fixed boundary*"

Additional Training

2015

Hochschuldidaktik Zertifikat der Universität des Saarlandes

Saarland University, Saarbrücken, Germany

Awards and Honors

- Advanced Scholarship, Leningrad State University, 1986-1990
- French Society "Promatématique" Young Mathematician's Award, 1995, 1996
- Honorary Postdoctoral Fellow of Institute Mittag-Leffler, Stockholm, 1999
- Honorary Research Member of Mathematical Sciences Research Institute, Berkeley CA, 2011
- Honorary Visiting Fellow of Isaac Newton Institute for Mathematical Science, Cambridge, 2014

Scientific Visits

09/1999 - 11/1999	Institute Mittag-Leffler the Royal Swedish Academy of Sciences, Stockholm, Sweden (program 1999/2000 <i>Potential Theory and Nonlinear Partial Differential Equations</i>)
07/2002	Australian National University, Canberra, Australien
02/2011-04/2011	Mathematical Sciences Research Institute, Berkeley CA, USA (program <i>Free Boundary Problems, Theory and Application</i>)
11/2011	Mathematical Bioscience Institute, Columbus OH, USA
02/2014-04/2014	Isaac Newton Institute for Mathematical Sciences, Cambridge, UK (program <i>Free Boundary Problems and Related Topics</i>)

Conferences/Workshops arrangements

<ul style="list-style-type: none">• International Conference “Geometric Methods in Nonlinear PDE’s and Free Boundary Problems”, St. Petersburg, 17.-20. August 2006
<ul style="list-style-type: none">• International Workshop “Saarbrücken Days on Free Boundary Problems”, Saarbrücken, 13.-14. December 2007
<ul style="list-style-type: none">• DMV-Tagung 2012, Sektion “Partielle Differentialgleichungen”, Saarbrücken, 17.-20. September 2012
<ul style="list-style-type: none">• “Advances in Nonlinear PDE” in honor of Nina N. Uraltseva and on the occasion of her 80th anniversary, St. Petersburg, 3.-5. September 2014

Administrative duties

- Administrative Research Coordinator, RFFR Grants, St. Petersburg State University, 1999-present
- Head of the Library Commission, Department of Mathematics, Saarland University, 2002-2012
- Member of “Berufungskommission Nachfolge M. Grüter”, Department of Mathematics, Saarland University, 2005
- Member of Board of Examiners (“Prüfungsausschuss”) for Bachelor/Master Mathematics and Lehramt Mathematics, Saarland University, 2012-2015

Referee, Reviewer and Editorial Activities

Referee for

Deutsche Forschungsgemeinschaft (DFG) – from 2013

"Annali di Matematica Pura ed Applicata"

"Commentationes Mathematicae Universitatis Carolinae"

"Complex Variables and Elliptic Equations"

"Discrete and Continuous Dynamical Systems – Series S"

"Interfaces and Free Boundaries"

"International Electronic Journal of Differential Equations"

"International Journal of Mathematics and Mathematical Sciences"

"Journal of Differential Equations"

"Journal of Nonlinear Analysis – A"

"Mathematical Methods in the Applied Sciences"

"Mathematical Notes"

"Mathematische Zeitschrift"

"Multiscale Modeling & Simulation (SIAM)"

"SIAM Journal on Control and Optimization"

"St. Petersburg Mathematical Journal"

"Translations of AMS (Ser.2)"

"Ufa Mathematical Journal"

"Zeitschrift für Analysis und ihre Anwendungen"

Reviewer for

"Mathematical Reviews" – from 2009

Associated Editor:

"Complex Variables and Elliptic Equations"

	International Presentations (invited talks)
2001	PDE Meeting (satellite to EQUADIFF 10), Prague, Czech Republic, 2001
2003	Winter School on Nonlinear Partial Differential Equations, Lisbon, Portugal, (Invited lecture series)
2005	Conference in honor of Nina Uraltseva's 70-th birthday, Stockholm, Sweden,
2005	Oberwolfach Workshop: "Partielle Differentialgleichungen", Mathematisches Forschungs-institut Oberwolfach
2007	Mini-workshop on "PDE's and Variational Tools in Image Inpainting", WPI, Vienna
2009	Workshop on "Systems Biology of Regulated Exocytosis in Pancreatic β -Cells", Copenhagen, Denmark
2011	Workshop "Connections for Women: Free Boundary Problems, Theory and Applications", MSRI, Berkeley, USA, January 2011
2011	The Conference on "Partial Differential Equations in Mathematical Physics and their Numerical Approximation", Levico, Italy
2011	International Workshop on Hysteresis and Slow-Fast Systems (HSFS-2011), Wittenberg, Germany
2012	Advances in Mathematical Analysis of PDEs, Stockholm, Sweden
2014	MURPHYS-HSFS-2014, Berlin, Germany, April 2014
2014	Progress in Nonlinear PDEs, Lisbon, Portugal
2015	Tagung "Konstanz: Women in Math-II", Konstanz, Germany
2015	8 th Workshop on Analysis and Advanced Numerical Methods for PDEs (AANPDE), Jyväskylä, Finland
2016	Mathematics and Literature, an international workshop, Óbidos, Portugal
2016	Russian-Finnish Workshop on History of Science, Jyväskylä, Finland

	International Presentations (regular talks & posters)
1994	5th International Spring School "Nonlinear Analysis, Function Spaces and Applications", Prague, Czech Republic
1995	International Workshop "Nonlinear Elliptic and Parabolic Problems", St. Petersburg, Russia
1997	Conference on Analysis and Applications, Brisbane, Australia
1998	6th International Spring School "Nonlinear Analysis, Function Spaces and Applications", Prague, Czech Republic
1998	"PDE Prague '98" Conference, Prague, Czech Republic
1999	"PDE's and Applications", Olomouc, Czech Republic
2000	Symposium Theory of PDE's and Special Topics of Theory of ODE's dedicated to 150th anniversary of birthday of S.V.Kovalevskaya, St. Petersburg, Russia
2000	EVEQ 2000 Summer School, Prague, Czech Republic, (Talk and Poster)
2000	3rd European Congress of Mathematics, Barselona, Spain, (Poster)
2001	10th Czechoslovak International Conference on Differential Equations and Their Applications, EQUADIFF 10, Prague, Czech Republic
2002	International Conference on Nonlinear PDE and Related Topics, Canberra, Australia
2003	Deutsche Mathematiker-Vereinigung Jahrestagung 2003, Rostock
2003	Interregional Colloquium of Mathematics, Metz, France
2007	Interregional Colloquium of Mathematics, Nancy, France
2007	"Saarbrücken Days on Free Boundary Problems", Saarbrücken
2011	The Sixth International Conference on Differential and Functional Differential Equations, DFDE-2011, Moscow, Russia, August 2011
2012	7 th European Conference on Elliptic and Parabolic Problems, Gaeta, Italy, May 2012
2012	International Conference on Quantum Fluids and Solids (QFS-2012), Lancaster, UK, (Poster)
2012	Deutsche Mathematiker-Vereinigung Jahrestagung 2012, Saarbrücken
2012	European Women in Mathematics. German Chapter Conference 2012, Bielefeld, Germany
2013	European Women in Mathematics 16 th General Meeting, Bonn, Germany
2014	8 th European Conference on Elliptic and Parabolic Problems, Gaeta, Italy
2014	7 th International Conference on Differential and Functional Differential Equations, DFDE-2014, Moscow, Russia
2015	COPDE-2015, Munich, Germany
2015	4 th International Conference on Mathematical Modeling in Physical Sciences, Mykonos, Greece, (Talk and Poster)
2016	9 th European Conference on Elliptic and Parabolic Problems, Gaeta, Italy

Invited Seminar Talks (in foreign countries)

1993	Moscow State University
1994	Charles University, Prag
1997	Macquarie University, Sydney
1997, 2010	Mathematical Institute Academy of Sciences, Prag
1999	Institut Mittag-Leffler the Royal Swedish Academy of Sciences, Stockholm
2000	Helsinki University
2001	Australian National University, Canberra
2002	Nyhon University, Tokio
2002	Keio University, Yokohama
2005 (2 talks)	Wolfgang Pauli Institute, Wien
2006	University of Copenhagen
2008	St. Petersburg State Technical University
2011	University of California, Berkeley
2011 (2 talks)	Texas Tech University, Lubbock
2012	Université de Metz
2015 (2 talks)	St. Petersburg Department of Steklov Institute of Mathematics
2015, 2016	Peoples' Friendship University of Russia, Moscow
2016	CMAF & IO, Universität Lissabon
2016 (2 talks)	Moscow State University

Invited Seminar Talks (in Germany)

1999, 2011, 2013-2017	Universität des Saarlandes, Saarbrücken
1999	Universität Paderborn
2005, 2012	Free University, Berlin
2006	University of Leipzig
2010	Otto-von-Guericke-University Magdeburg
2012	University of Bremen
2012	University of Mannheim
2013	Justus-Liebig-University, Gießen
2013	University of Duisburg-Essen
2013	FernUniversity, Hagen
2014	Ludwig Maximilians University, Munich
2015	University of Rostock
2016	MPI Leipzig
2016	University of Köln

Teaching Experience

Saarland University, Saarbrücken, Germany

<i>PDE and Boundary-Value Problems</i>	Lectures	6 CP	WT 16/17 + WT 15/16 WT 14/15 + WT 13/14 WT 12/13
<i>Frauen in der Mathematik</i>	Lectures	4.5 CP	WT 14/15
<i>Calculus of Variations</i>	Lectures	6 CP	ST 17 + ST 16 + ST 15 ST 14 + ST 13
<i>Differentialgeometrie II (Flächentheorie)</i>	Lectures	4.5 CP	WT 13/14
<i>Differentialgeometrie I (Kurventheorie)</i>	Lectures	4.5 CP	ST 13
<i>Darstellungsmethoden für Lösungen partieller Differentialgleichungen</i>	Lectures	4.5 CP	ST 12
<i>Elementarkurs Partielle Differentialgleichungen</i>	Lectures	4.5 CP	ST 11 + WT 06/07 ST 05 + WT 04/05
<i>Freie Randwertprobleme</i>	Lectures	4.5 CP	ST 17 + WT 10/11
<i>Mathematik für Naturwissenschaftler II</i>	Lectures	5 CP	ST 10 + ST 06
<i>Mathematik für Naturwissenschaftler I</i>	Lectures	5 CP	WT 09/10 WT 05/06
<i>Höhere Mathematik für Ingenieure IV</i>	Lectures	4.5 CP	ST 09
<i>Höhere Mathematik für Ingenieure III</i>	Lectures	9 CP	WT 08/09
<i>Höhere Mathematik für Ingenieure II</i>	Lectures	9 CP	ST 08
<i>Höhere Mathematik für Ingenieure I</i>	Lectures	9 CP	WT 07/08
<i>Free Boundary Problems in Financial Mathematics</i>	Lectures	5 CP	ST 07
<i>Differentialgeometrie von Kurven und Flächen</i>	Proseminar	3 CP	WT 04/05
<i>Variational Calculus with Elementary Convexity</i>	Proseminar	3 CP	ST 03

People's Friendship University of Russia, Moscow

<i>Compact course of interdisciplinary lectures "Regularity Issues in Obstacle-Type Problems"</i>	Lectures		WT 16/17
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St. Petersburg State University of Architecture and Civil Engineering

<i>Mathematics for Civil Engineers II</i>	Lectures	ST 99 WT 94/95 + ST 95 WT 93/94 + ST 94
<i>Mathematics for Civil Engineering I</i>	Lectures	WT 94/95 + ST 95 WT 93/94 + ST 94

St. Petersburg State University

<i>Functional Analysis</i>	Lectures	WT 92/93 + ST 93
<i>Partial Differential Equations</i>	Tutorial	WT 92/93 + ST 93 WT 91/92 + ST 92

Supervision Activities

- **Member of PhD-Committee:**
 - ⇒ Stanislav Pokalyuk, “Discretization of Backward Stochastic Volterra Integral Equations”, Saarland University, Saarbrücken, 2012.
- **Reviewer of Master’s Thesis:**
 - ⇒ Hosnieh Sattar, “Integration of Direct and Gradient based Methods for Focus Fusion”, Saarland University, Saarbrücken, 2014.
 - ⇒ Hamidreza Heydarian, “Ridge Clustering with Osmosis”, Saarland University, Saarbrücken, 2015.
 - ⇒ Rajarshi Biswas, “A Coupled Variational Model for Denoising and Optic Flow Estimation”, Saarland University, Saarbrücken, 2016.
- **Official Opponent of PhD Thesis:**
 - ⇒ Gohar Aleksanyan, “Regularity of Solutions for Different Kinds of Partial Differential Equations, Involving Free Boundaries”, KTH Stockholm, 2016.
- **Co-Supervision of PhD Thesis:**
 - ⇒ Dominik Breit, “New Regularity Theorems for Anisotropic Variational Integrals”, Saarland University, 2009. (co-supervision with M. Fuchs)

Third Party Funding

1993-1995	International Science Foundation Grant No. ME 4000 (Co-Investigator)	
1993-1995	RFFR (Russian Fund for Fundamental Research) Grant " <i>Mathematical problems in the theory of nonuniform media</i> " (Co-Investigator)	
1996-1998	RFFR Grant " <i>Nonlinear elliptic and parabolic problems generated by multiphase processes</i> " (Co-Investigator)	
1999-2001	RFFR Grant " <i>Non-classical nonlinear boundary value problems for partial differential equations</i> " (Co-Investigator and Administrative Research Coordinator)	6.500 €
2002-2004	RFFR Grant " <i>Free boundary problems and multiphase media models</i> " (Co-Investigator and Administrative Research Coordinator)	13.000 €
2005-2007	RFFR Grant " <i>Elliptic and parabolic problems with nonstandard nonlinearities</i> " (Co-Investigator and Administrative Research Coordinator)	23.000 €
2008-2010	RFFR Grant " <i>Global and local properties of solutions of elliptic and parabolic equations with variational structure</i> " (Co-Investigator and Administrative Research Coordinator)	24.500 €
2009-2011	RFFR Grant " <i>Development of the geometric and analytical methods of investigating the nonlinear boundary-value problems</i> " (Co-Investigator and Administrative Research Coordinator)	26.000 €
2011-2013	RFFR Grant " <i>Regularity and qualitative properties of solutions for nonlinear problems of variational nature</i> " (Co-Investigator and Administrative Research Coordinator)	28.000 €
2012-2014	RFFR Grant " <i>Development of geometric and analytic methods of investigation the nonlinear boundary value problems with degeneration</i> " (Co-Investigator and Administrative Research Coordinator)	35.000 €
2013-2015	St. Petersburg State University Research Grant " <i>PDEs and Applications</i> " (Co-Investigator and Administrative Research Coordinator)	130.000 €
2014-2016	RFFR Grant " <i>Nonclassical variational problems and free boundary problems</i> " (Co-Investigator and Administrative Research Coordinator)	37.000 €
2015-2017	RFFR Grant " <i>Nonlinear evolution problems and applications</i> " (Co-Investigator and Administrative Research Coordinator)	35.000 €
2016	G-RISC (German-Russian Interdisciplinary Science Center) M-2016b-3 <i>Compact course of interdisciplinary lectures "Regularity Issues in Obstacle-Type Problems"</i>	1.385 €
2017-2019	RFFR Grant " <i>Nonlinear evolution problems and applications</i> " (Co-Investigator and Administrative Research Coordinator)	12.500 € for 2017
		Σ = 371.885 €

*) RFFR=Russian Fund for Fundamental Research

Research Interests

My research focuses on analysis of nonlinear phenomena. My studies include the boundary-value problems for nonlinear equations with singularities and problems in domains with non-smooth boundaries, boundary-value problems with the Venttsel conditions, the variational problems with non-standard growth conditions on the integrand, and, of course, the free boundary problems and their applications to biology and solid state physics.

10 chosen Publications

- [1] *A counterexample to the Hopf-Oleinik lemma (elliptic case)*, (with A.I. Nazarov), Analysis & PDE, **9** (2016), no.2, 439-458.
- [2] *Free boundaries in problems with hysteresis*, (with N.N. Uraltseva), Philosophical Transactions of the Royal Society A, **373** (2015), 20140271. <http://dx.doi.org/10.1098/rsta.2014.0271>.
- [3] *On regularity properties of solutions to hysteresis-type problems*, (with N.N. Uraltseva), Interfaces and Free Boundaries, **17** (2015), no.1, 93-115; DOI 10.4171/IFB/335.
- [4] *Uniform estimates near the initial states for solutions of the two-phase parabolic problems*, (with N.N. Uraltseva), Algebra & Analysis, **25** (2013), no. 2, 63-74.
- [5] *Chapter 23. Geometric and electromagnetic aspects of fusion pore making*, (with E. Apushkinsky, B. Boß-Bavnbek und M. Koch), Systems Biology (Springer Book Series), vol. 2, Systems biology of regulated exocytosis in pancreatic β -cells, Springer Verlag, 2011.
- [6] *The behavior of the free boundary close to a fixed boundary in a parabolic problem*, (with N. Matevosyan and N.N. Uraltseva), Indiana Univ. Math. J. **58** (2009), no. 2, 583-604.
- [7] *Steady states of anisotropic generalized Newtonian fluids*, (with M. Bildhauer and M. Fuchs), J. Math. Fluid Mech., **7** (2005), no. 2, 261-297.
- [8] *Linear two-phase Venttsel problems*, (with A.I. Nazarov), Arkiv Math., **39** (2001), 201-222.
- [9] *A survey of results on nonlinear Venttsel problems*, (with A.I. Nazarov), Appl. Math., **45** (2000), no.1, 69-80.
- [10] *The Venttsel' problem for nonlinear elliptic equations*, (with A.I. Nazarov), J. Math. Sci., **101** (2000), 2861-2880.

