Yulia Petrova

Personal Data

Date of Birth:	29 June 1991
Phone, email:	+7 952 2222410, yu.pe.petrova@yandex.ru
Homepage:	https://yulia-petrova.github.io/
Current position:	Instituto de Matematica Pura e Applicada, Rio de Janeiro, Brazil. Postdoc.

Research interests

- Hyperbolic conservation laws
- Multiphase flow in porous media
- Partial differential equations
- Gaussian processes
- Spectral theory

Education

2013–2018	PhD student in Mathematical Physics, St. Petersburg State University, Russia. Supervisor: Prof. Nazarov A. I. Date of defence: November 2018. PhD thesis: «Exact L_2-small ball asymptotics for finite-dimensional perturbations of Gaussian processes» (in Russian)
2008–2013	MSc in Mathematics, chair of Mathematical Physics, St. Petersburg State University, Russia

Professional Experience

2021– present	Postdoc at Instituto de Matematica Pura e Applicada (IMPA), Rio de Janeiro, Brazil. Researcher at Center PI, IMPA.
2017–Present	Researcher at Chebyshev laboratory, Saint Petersburg State University, Russia. Participant of industrial projects with PJSC «Gazprom Neft».
2018–2021	Teaching at Department of Mathematics and Computer Science, Saint Petersburg State University, Russia.
2014–2018	Assistant at Department of Mathematics and Information Technology, Saint Petersburg Academic University, Russia.
2012–2015	Assistant at Institute of Physics, Nanotechnology and Telecommunications, Saint Petersburg Polytecnic University, Russia.

Research Awards

2019	Laureat of the «Young Mathematician» prize of the Saint-Petersburg Mathematical Society
2018–2019	«Gazprom Neft» Scholarship
2018	Winner of 22nd Möbius Contest in nomination «Undergraduates and graduates»

Research Grants

2021	Executor of the Russian Science Foundation grant 21-11-00047: Stochastic processes and fields with application to data analysis
2019–2021	Participant of the Russian Science Foundation grant 19-71-30002: Analysis, geometry, mathematical physics and applications
2019–2020	Participant of the President grant MD-1791.2019.1: Parabolic equations describing displacement of viscous fluids in porous media and systems with hysteresis
2017–2018	Participant of Russian Science Foundation Grant 17-11-01003: Asymptotic spectral analysis: gaps, near-threshold anomalies, "invisibility" and eigenvalues
2016–2018	Participant of RFBR Grant 16-01-00258a: Approximation of stochastic processes and functionals of them
2013–2016	Participant of St Petersburg State University Grant 6.38.670.2013: Partial Differential Equations and applications

Research Papers and Preprints

2022	F. Bakharev, A. Enin, A. Groman, A. Kalyuzhnuk, S. Matveenko, Yu. Petrova, I.Starkov, S. Tikhomirov, Velocity of viscous fingers in miscible displacement: Comparison with analytical models. Journal of Computational and Applied Mathematics, March 2022. Link.
2021	F. Bakharev, A. Enin, Yu. Petrova, N. Rastegaev, Impact of dissipation ratio on vanishing viscosity solutions of the Riemann problem for chemical flooding model. Preprint arXiv:2111.15001.
2021	F. Bakharev, A. Enin, K. Kalinin, Yu. Petrova, N. Rastegaev, S. Tikhomirov, Optimal polymer slugs injection profiles. arXiv:2012.03114.
2021	S. Tikhomirov; F. Bakharev; A. Groman; A. Kalyuzhnyuk; Yu. Petrova; A. Enin; K. Kalinin; N. Rastegaev, Calculation of graded viscosity banks profile on the rear end of the polymer slug. SPE Russian Petroleum Technology Conference, October 2021.
2021	Yu. Petrova, L_2-small ball asymptotics for a family of finite-dimensional perturbations of Gaussian functions. Zapiski Nauchnykh Seminarov POMI, vol. 501. Nikitin's memorial volume, pp. 236–258. Link (in Russian). For the English version see arXiv:1905.07804.
2020	F. Bakharev, L. Campoli, A. Enin, S. Matveenko, Yu. Petrova, S. Tikhomirov, A. Yakovlev Numerical investigation of viscous fingering phenomenon for raw field data. Transport in Porous Media, 2020, pp. 1–22.
2018	Yu. Petrova, On spectral asymptotics for a family of finite-dimensional perturbations of operators of trace class. Doklady Math., 2018, vol. 98, №1, pp. 367–369.
2017	Yu. Petrova, Exact L_2-small ball asymptotics for some Durbin processes. Zap. nauchn. sem. POMI, 2017, vol. 466, pp. 211–233. (In Russian) Translated: Journal of Mathematical Sciences (USA), 2020, 244(5), pp. 842-857.
2016	Yu. Petrova, Spectral asymptotics for problems with integral constraints. Mat. Zametki, 2017, vol. 102(3), pp. 405–414 (In Russian). Translated: Mathematical Notes, 2017, 102(3-4), pp. 369-377.
2015	A. I. Nazarov, Yu. P. Petrova, The small ball asymptotics in Hilbertian norm for the Kac–Kiefer–Wolfowitz processes. Teor. Veroyatnost. i Primenen., 2015, Volume 60, Issue 3, Pages 482–505. Translated: Theory of Probability and its Applications, 2016, 60(3), pp. 460-480.

Presentations at Conferences & Schools

Aug 2021	InterPore2021. Brazilian Chapter. Link
Jun 2021	InterPore2021. Online conference. Link
Aug 2019	Third ZiF Summer School «Randomness in Physics and Mathematics» From Stochastic Processes to Networks. Bielefeld, Germany. Poster.
May 2019	Stochastic models II . Euler Institute, Saint-Petersburg. Talk.
Jan 2018	The third Indo-Russian meeting in probability and statistics. Talk: Exact small ball asymptotics in L_2-norm for finite-dimensional perturbations of Gaussian processes: spectral method
Dec 2017	Saint-Petersburg winter conference on Probability Theory and Mathematical physics. PDMI-MIAN. Talk: On exact spectral asymptotics of finite-dimensional perturbations of integral operators of trace class
June 2017	Symposium on Probability Theory and Random Processes. Talk: Exact small ball asymptotics in L_2-norm for some perturbations of the Brownian bridge
April 2017	International conference on partial differential equations — Silkroad Mathematics Center series international conferences (Beijing, China, 10–21 April2017). Poster: Spectral asymptotics in some problems with integral constraints.
June 2016	Days of Diffraction-2016. Talk: Spectral asymptotics in some problems with integral constraints.
May 2016	The 2nd Russian-Indian Joint Conference in Statistics and Probability. Talk: Small ball asymptotics for detrended Green Gaussian processes of arbitrary order.
Sept 2015	Yu.V.Linnik Centennial Conference. Talk: The small ball asymptotics in L_2-norm for the Kac-Kiefer-Wolfowitz processes
July 2015	7th St.Petersburg Conference in Spectral Theory. Talk: Asymptotics of eigenvalues for some integro-differential operators
July 2014	Students school on Partial Differential Equations and Geometric Measure Theory, CIME, Italy
July 2010	XIII Diffiety School on Mathematics, Santo Stefano del Sole (AV)
July 2009	XII Diffiety School on Mathematics, Santo Stefano del Sole (AV)

Languages

Russian:	Native speaker
English:	Fluent
Spanish:	Fluent
Portuguese:	Reading and writing, basic speaking

Skills

Organizational:	with colleagues we organize a seminar «Industrial Mathematics» from Feb 2019; in 2014 I was accompanying a group of 15 scholars (of 14-17 age) from St. Petersburg (Russia) to Seville (Spain) to a summer math camp Formulo de Integreco;
Industrial:	I finished 6 successful industrial projects on EOR methods with «Gazprom Neft» in 2018–2021 in St Petersburg, Russia;
Teamwork:	I have an experience working in a team of 13 people (2 professors, 6 mathematicians from students to postdocs, 3 numerical modellists, 1 chemist, 1 physicist) and leading a subproject of 5 people. Usually I am the leader of the group of 1-3 people.
Programming:	COMSOL Multiphysics, Matlab, basics of Python. Among numerical methods I worked with FEM, FVM, FDM.
Adaptivity:	I easily adapt to different countries. I have been to almost all European countries, India, China, Pakistan, Egypt, Mexico. Now I am a postdoc in Brazil.
Teaching:	I have teaching experience in University from 2012 in a problem solving classes (practic classes) in: Mathematical physics for physicists, 2-year program in calculus for physicists / programmers (as an example see materials from complex-variable course, spring 2020, in Russian only), probability theory and calculus of variations for mathematicians.

Additional experience

2012–2017	Teaching in Formulo de Integreco — International Educational Center for gifted high-school Students
Jan 2019	Lecturer of the course «Random walks» in Educational Program in mathematics and computer science at Educational Center «Sirius»
Nov 2019	Assistant to the course «Dynamical systems» in COMSATS University Islamabad, Lahore Campus, Pakistan. ICTP-CUI Visiting Scholars Program for Training and Research in Mathematics