

# Yulia PETROVA

## PERSONAL DATA

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DATE OF BIRTH: 29 June 1991  
PHONE, EMAIL: +7 952 2222410, [yu.pe.petrova@yandex.ru](mailto:yu.pe.petrova@yandex.ru)  
HOMEPAGE: <http://chebyshev.spbu.ru/en/people/petrova-yu-p/>  
CURRENT POSITION: Instituto de Matematica Pura e Aplicada, Rio de Janeiro, Brazil. Postdoc.

## RESEARCH INTERESTS

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

## EDUCATION

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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

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2021– PRESENT | Postdoc at [Instituto de Matematica Pura e Aplicada](#) (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 Polytechnic University, Russia.

## RESEARCH GRANTS AND AWARDS

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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  
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»  
2017–2018 | Participant of RNF 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

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- 2021 | F. Bakharev, P. Bedrikovetsky, A. Enin, Yu. Petrova, N. Rastegaev, On the impact of dissipation ratio on vanishing viscosity solutions of Riemann problems for chemical flooding models. Work in progress.
- 2021 | F. Bakharev, A. Enin, K. Kalinin, Yu. Petrova, N. Rastegaev, S. Tikhomirov, Optimal polymer slugs injection profiles. [arXiv:2012.03114](#).
- 2021 | 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, 2021. [Link](#).
- 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.
- 2019 | Yu. Petrova, [L<sub>2</sub>-small ball asymptotics for a family of finite-dimensional perturbations of Gaussian functions](#). arXiv:1905.07804.
- 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<sub>2</sub>-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

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AUG 2021	InterPore2021. Brazilian Chapter. <a href="#">Link</a>
JUN 2021	InterPore2021. Online conference. <a href="#">Link</a>
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

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RUSSIAN:	Native speaker
ENGLISH:	Fluent
SPANISH:	Fluent
PORTUGUESE:	Reading and writing

## SKILLS

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Organizational:	with colleagues we organize a seminar <a href="#">«Industrial Mathematics»</a> 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 <a href="#">summer math camp Formulo de Integreco</a> ;
Industrial:	I finished 6 successful industrial projects on EOR methods with «Gazprom Neft»
Teamwork:	currently I work in a team of 13 people (2 professors, 6 mathematicians from students to postdocs, 3 numerical modellers, 1 chemist, 1 physicist). I have experience of 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.
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 <a href="#">materials from complex-variable course</a> , spring 2020, in Russian only), probability theory for mathematicians.

## ADDITIONAL EXPERIENCE

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