

Vitalii Konarovskiy

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Birth date and place: April 30, 1986, Ternopil Oblast, Ukraine

Married, 2 children

Work

- **Collaborative Research Center 1283, Bielefeld University** Bielefeld, Germany
Scientific Assistant Oct 2021 – present
– – Mentor: Benjamin Gess
- **Department of Mathematics, Hamburg University** Hamburg, Germany
Substitute W2-professor Oct 2020 – Sept 2021
- **Institute of Mathematics, Leipzig University** Leipzig, Germany
Postdoc (on leave from Oct 2020) Oct 2015 – Jan 2023
– – Mentor: Max von Renesse
- **Max Planck Institute for Mathematics in the Sciences** Leipzig, Germany
Postdoc Oct 2014 – Oct 2015
– – Mentor: Max von Renesse
- **Institute of Stochastics, Friedrich Schiller University Jena** Jena, Germany
Postdoc Nov 2013 – Apr 2014
– – Mentors: Björn Schmalfuss and Ilya Pavlyukevich
- **Department of Mathematics and Informatics, Yuriy Fedkovych Chernivtsi National University** Chernivtsi, Ukraine
Assistant professor Feb 2011 – Oct 2015
- **Institute of Mathematics of NAS of Ukraine** Kyiv, Ukraine
Junior researcher Nov 2010 – Feb 2011

Education

- **Institute of Mathematics of NAS of Ukraine** Kyiv, Ukraine
Candidate of Sciences in Physics and Mathematics (PhD equivalent) Nov 2007 – Nov 2010
– Advisor: Andrey A. Dorogovtsev
– Thesis: The system of interaction particles with variable weights
(date of degree: May 17, 2012)
- **Yuriy Fedkovych Chernivtsi National University** Chernivtsi, Ukraine
Master's degree in Mathematics Sept 2006 – June 2007
– Advisor: Andrey A. Dorogovtsev

– Thesis: Some properties of coalescing Brownian motions

- **Yuriy Fedkovych Chernivtsi National University**
Bachelor's degree in Mathematics

Chernivtsi, Ukraine
Sept 2002 – June 2006

– Advisor: Mykhailo I. Matiichuk

– Thesis: Control problem for a system of PDE with time dependent coefficients

Scholarships and Grants

- **Humboldt Research Fellowships for Postdoctoral Researchers** *Nov 2016 – Nov 2018*
Mathematisches Institut, Universität Leipzig Leipzig, Germany
- **Erasmus Mundus IANUS scholarship** *Nov 2013 – Apr 2014*
Institute of stochastics, Friedrich Schiller University Jena Jena, Germany

Participation in the Russian-Ukrainian Grant

- **“Asymptotic Behavior of Stochastic Flows”**.
Stage 2 “Limit Theorems for Flows with Singularities” *2009 – 2010*
between the Department of Mechanics and Mathematics of Moscow State University and Institute of Mathematics NAS of Ukraine Heads: Vladimir I. Bogachev
and Andrey A. Dorogovtsev
- **Participation in the Russian-Ukrainian Grant**
“Asymptotic Behavior of Stochastic Flows” *2008 – 2009*
between the Department of Mechanics and Mathematics of Moscow State University and Institute of Mathematics NAS of Ukraine Heads: Vladimir I. Bogachev
and Andrey A. Dorogovtsev

Short visits

- **School of Mathematics** *Sept 1 – Oct 2, 2019*
Jilin University (Visiting Professor) Changchun, China
- **IRMA** *Feb 9 – March 6, 2020*
University of Strasbourg (Visiting Professor) Strasbourg, France

Publications

1. *Stochastic Modified Flows, Mean-Field Limits and Dynamics of Stochastic Gradient Descent*, (with Benjamin Gess and Sebastian Kassing), preprint (24 pages), arXiv:2302.07125
2. *Conservative SPDEs as fluctuating mean field limits of stochastic gradient descent*, (with Benjamin Gess and Rishabh S. Gvalani), preprint (65 pages), arXiv:2207.05705.
3. *Spectral gap estimates for Brownian motion on domains with sticky-reflecting boundary diffusion*, (with Max von Renesse and Victor Marx), preprint (20 pages), arXiv:2106.00080.

4. *Reversible Coalescing-Fragmentating Wasserstein Dynamics on the Real Line*, (with Max von Renesse), preprint (45 pages), arXiv:1709.02839.
5. *On Conditioning Brownian Particles to Coalesce*, (with Victor Marx), to appear in *Journal of Theoretical Probability* (38 pages), arXiv:2008.02568.
6. *On Moments of Multiplicative Coalescents*, (with Vlada Limic), to appear in *Annales de l'Institut Henri Poincaré* (23 pages), arXiv:2108.11799.
7. *Coalescing-fragmentating Wasserstein dynamics: particle approach*, to appear in *Annales de l'Institut Henri Poincaré* (44 pages), arXiv:1711.03011.
8. *On Number of Particles in Coalescing-Fragmentating Wasserstein Dynamics*, *Theory Stoch. Process.* **25**(41) (2020), no. 2, 74–80.
9. *Stochastic Block Model in a new critical regime and the Interacting Multiplicative Coalescent*, (with Vlada Limic), *Electron. J. Probab.* **26** (2021), no. 1, 23 pp.
10. *Sticky-Reflected Stochastic Heat Equation Driven by Colored Noise*, *Ukrainian Math. J.* **72** (2021), no. 9, 1377-1419.
11. *Dean-Kawasaki Dynamics with smooth Drift Potentials*, (with Tobias Lehmann and Max von Renesse), *J. Stat. Phys.* **178** (2020), no. 3, 666-681. MR4059955
12. *Dean-Kawasaki dynamics: ill-posedness vs. triviality*, (with Tobias Lehmann and Max von Renesse), *Elect. Comm. Probab.* **24** (2019), no. 8, 9 pp. MR3916340
13. *Modified massive Arratia flow and Wasserstein diffusion*, (with Max von Renesse), *Comm. Pure Appl. Math.* **72** (2019), no. 4, 764-800. MR3914882
14. *A system of coalescing heavy diffusion particles on the real line*, *Ann. Probab.* **45** (2017), no. 5, 3293–3335. MR3706744
15. *On asymptotic behavior of the modified Arratia flow*, *Electron. J. Probab.* **22** (2017), no. 19, 31 pp. MR3622889
16. *Large deviations principle for finite system of heavy diffusion particles*, *Theory Stoch. Process.* **19** (2014), no. 1, 37–45. MR3337132
17. *Mathematical model of heavy diffusion particles system with drift*, *Commun. Stoch. Anal.* **7** (2013), no. 4, 591–605. MR3213281
18. *The martingale problem for a measure-valued process with heavy diffusing particles*, *Theory Stoch. Process.* **17** (2011), no. 1, 50–60. MR3076876
19. *System of sticking diffusion particles of variable mass*, *Ukrainian Math. J.* **62** (2010), no. 1, 97–113. MR2888581
20. *On an infinite system of diffusing particles with coalescing*, *Teor. Veroyatn. Primen.* **55** (2010), no. 1, 157–167. MR2768524

Participation in Workshops and Conferences

- **International Conference of Young Mathematicians**
Institute of Mathematics NAS of Ukraine

Kyiv, Ukraine (Online)
June 1-3, 2023

- **16th German Probability and Statistics Days 2023** *Essen, Germany*
University of Duisburg-Essen Mar 7-10, 2023
- **DMV Annual Meeting 2022** *Berlin, Germany*
Freie Universität Sep 12-16, 2022
- **Summer School "Mathematics of Large Networks"** *Budapest, Hungary*
Erdos Center May 30-Jun 3, 2022
- **Ninth Bielefeld-SNU Joint Workshop in Mathematics** *Seoul, South Korea (Online)*
Seoul National University May 18-20, 2022
- **German Probability & Statistics Days Mannheim** *Mannheim, Germany (Online)*
University of Mannheim Sept 27-Oct 01, 2021
- **International Frontiers of Mathematics** *Changchun, China (Online)*
Jilin University Sept 15-17, 2021
- **Bernoulli-IMS One World Symposium 2020** *Online*
Aug 24-28, 2020
- **Geometry and Dynamics** *Jena, Germany*
Friedrich Schiller University Jena July 5, 2019
- **Thematic programme "Optimal transport"** *Vienna, Austria*
ESI, University of Vienna May 15-24, 2019
- **Mini School in Probability** *Changchun, China*
Jilin University Apr 8-14, 2019
- **Berlin-Leipzig Workshop in Analysis and Stochastics** *Leipzig, Germany*
MPI Leipzig Jan 16-18, 2019
- **Stoch. Equations, Limit Theorems and Statistics of Stoch. Processes** *Kyiv, Ukraine*
Igor Sikorsky Kyiv Polytechnic Institute Sep 17-22, 2018
- **12th International Vilnius Conf. on Probab. Th. and Math. Stat.** *Vilnius, Lithuania*
Vilnius University July 2-6, 2018
- **Berlin-Leipzig Workshop in Analysis and Stochastics** *Leipzig, Germany*
MPI Leipzig Nov 29-Dec 01, 2017
- **Mitteldeutscher Stochastik Workshop** *Leipzig, Germany*
MPI Leipzig Nov 17-18, 2017
- **Metric Measure Spaces and Ricci Curvature** *Bonn, Germany*
MPI Bonn (without talk) Sept 04-08, 2017
- **PIMS-CRM Summer School in Probability** *Vancouver, Canada*
Pacific Institute for the Mathematical Sciences, UBC June 5-30, 2017
- **Stoch. calculus and geometry of stoch. flows and singular interactions** *Jena, Germany*
Friedrich Schiller University Jena Nov 15, 2016
- **Singular Random Dynamics** *Cetraro, Italy*
CIME-EMS Summer School (without talk) Aug 22-26, 2016

- **Berlin-Leipzig workshop in analysis and stochastics** *Leipzig, Germany*
MPI Leipzig April 13-15, 2016
- **Stochastic Analysis 2015: Halle-Jena-Leipzig** *Halle, Germany*
Martin-Luther-Universität Halle-Wittenberg Oct 16-17, 2015
- **Workshop on Levy-Driven Stochastic Dynamics** *Jena, Germany*
Friedrich Schiller University Jena April 17, 2014
- **11th International Vilnius Conf. on Probab. Th. and Math. Stat.** *Vilnius, Lithuania*
Vilnius University June 30-July 4, 2014
- **Infinite dimensional stochastic systems: Theory and applications** *Wittenberg, Germany*
(poster talk) Jan 13-16, 2014
- **Bogolyubov readings DIF-2013.** *Sevastopol, Ukraine*
June 23-30, 2013
- **Stochastic Analysis and Random Dynamical Systems** *Lviv, Ukraine*
Ivan Franko National University of Lviv June 14-20, 2009

Seminar talks

- “SFB-Kolloquium”, University of Potsdam, Potsdam, Germany (May 2023)
- “MATHPHYS Analysis Seminar”, Institute of Science and Technology Austria, Vienna, Austria (April 2023)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (April, 2023)
- “AG Analysis-Probability”, Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany (April 2023)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (April, Nov 2022)
- “Bielefeld Stochastic Afternoon”, Bielefeld University, Bielefeld, Germany (Nov 2021)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (Feb, Nov 2021)
- “Kolloquium über Mathematische Statistik und Stochastische Prozesse”, Hamburg University, Germany (Nov 2020)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (April, Sep 2020)
- “Séminaire (de calcul) stochastique”, Institut de Recherche Mathématique Avancée, Strasbourg, France (March 2020)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (Nov 2019)
- Heriot-Watt University, Edinburgh, UK (June 2019)

- “Séminaire (de calcul) stochastique”, Institut de Recherche Mathématique Avancée, Strasbourg, France (April 2019)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (March 2019)
- “Research Seminar RTG 2131”, University of Duisburg-Essen, Germany (Oct 2018)
- “Probability”, University of Cambridge, UK (May 2018)
- “ProbL@b seminar”, University of Bath, UK (May 2018)
- “Statistical Mechanics Seminar”, University of Warwick, UK (Mar 2018)
- “Research Unit — Rough paths, stochastic partial differential equations and related topics”, TU Berlin, Germany (Feb 2018)
- “Arbeitsgemeinschaft ANGEWANDTE ANALYSIS”, MPI Leipzig, Germany (Jan 2018)
- “Oberseminar Analysis”, Institute for Applied Mathematics, Universität Bonn, Germany (Dec 2016)
- “Arbeitsgemeinschaft ANGEWANDTE ANALYSIS”, MPI Leipzig, Germany (June 2015)
- MPI Leipzig, Germany (April 2014)
- Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany (April 2014)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (May 2014)
- Institute of Stochastics, Friedrich Schiller University Jena, Germany (Dec 2013)
- Department of Mathematics and Informatics, Yuriy Fedkovich Chernivtsi National University, Chernivtsi, Ukraine (June 2013, Jan 2011)
- “Malliavin Calculus and its Application”, Institute of Mathematics NAS of Ukraine, Kyiv, Ukraine (May 2012, Feb 2011, Nov 2010, June 2010, Dec 2009, Jan 2009, May 2008)
- “Theory of stochastic processes”, Faculty of Physics and Mathematics, Kyiv Polytechnic Institute, Ukraine (June 2011)
- “Stochastic Differential Equations”, Faculty of Mechanics and Mathematics, Taras Shevchenko National University of Kyiv, Ukraine (June 2011)
- Faculty of Mechanics and Mathematics, University of Lviv, Ukraine (May 2011)
- “Infinite Dimensional Analysis and Stochastics”, Department of Mechanics and Mathematics, Moscow State University, Russian Federation (Oct 2008)

Teaching

Lectures:

- [Stochastic Differential Equations and Diffusion Processes](#)

Hamburg University, SS 2021

- Seminar - Application of large deviations to statistical mechanics *Hamburg University, SS 2021*
- Stochastik 1 für Studierende der Informatik *Hamburg University, SS 2021*
- An introduction to large deviations *Hamburg University, WS 2020/21*
- Seminar - Stoch. flows with interaction and random measures *Hamburg University, WS 2020/21*
- Stochastik 2 für Studierende der Informatik *Hamburg University, WS 2020/21*
- Mathematics 4 for physicists *Leipzig University, SS 2020*
- An introduction to large deviations *Leipzig University, WS 2019/20*
- Mathematics 3 for physicists *Leipzig University, WS 2019/20*
- An introduction to large deviations (mini-course) *Jilin University, China, Sep 2019*
- Mathematics 2 for physicists *Leipzig University, SS 2019*
- Mathematics 1 for physicists *Leipzig University, WS 2018/19*
- Mathematics 4 for physicists *Leipzig University, SS 2016*
- Mathematics 3 for physicists *Leipzig University, WS 2015/16*
- Stochastic processes *Chernivtsi University, WS 2013/14*
- Mathematical statistics *Chernivtsi University, WS 2013/14*
- Theory of semi-groups of Markov processes *Chernivtsi University, WS 2013/14*
- Probability *Chernivtsi University, SS 2013*
- Theory of semi-groups of Markov processes *Chernivtsi University, WS 2012/13*
- Mathematical statistics *Chernivtsi University, WS 2012/13*
- Stochastic processes *Chernivtsi University, WS 2012/13*
- Probability *Chernivtsi University, SS 2012*
- Mathematical statistics *Chernivtsi University, WS 2011/12*

Teaching seminars:

- Wahrscheinlichkeitstheorie *Bielefeld University, SS 2023*
- Analysis I *Bielefeld University, WS 2022/23*
- Mathematik für Naturwissenschaften II *Bielefeld University, SS 2022*
- Analysis II *Bielefeld University, WS 2021/22*
- Mathematical statistics *Chernivtsi University, WS 2013/14*
- Theory of semi-groups of Markov processes *Chernivtsi University, WS 2013/14*
- Probability and mathematical statistics *Chernivtsi University, WS 2013/14*
- Markov and semi-Markov processes *Chernivtsi University, SS 2013*

- Probability *Chernivtsi University, SS 2013*
- Probability and mathematical statistics *Chernivtsi University, SS 2013*
- Mathematical statistics *Chernivtsi University, WS 2012/13*
- Stochastic processes *Chernivtsi University, WS 2012/13*
- Markov and semi-Markov processes *Chernivtsi University, WS 2012/13*
- Probability and mathematical statistics *Chernivtsi University, WS 2012/13*
- Theory of semi-groups of Markov processes *Chernivtsi University, WS 2012/13*
- Probability *Chernivtsi University, SS 2012*
- Probability and mathematical statistics *Chernivtsi University, SS 2012*
- Markov and semi-Markov processes *Chernivtsi University, SS 2012*
- Mathematical statistics *Chernivtsi University, WS 2011/12*
- Probability *Chernivtsi University, WS 2011/12*
- Probability and mathematical statistics *Chernivtsi University, WS 2011/12*
- Stochastic processes *Chernivtsi University, WS 2011/12*
- Probability and mathematical statistics *Chernivtsi University, SS 2011*
- Mathematical statistics *Kyiv Polytechnic Institute, SS 2010*
- Probability *Kyiv Polytechnic Institute, WS 2009/10*

Supervision of master students:

- Alexander Weiß (Hamburg University, 2020-2021)
Liouville's theorem for SDEs with interaction
- Dumytrash Khrystyna (Chernivtsi University, 2013-2014)
Asymptotic behaviour of a heavy diffusion particle in Arratia flow
- Romaniuk Tetiana (Chernivtsi University, 2013-2014)
Generalized system of heavy diffusion particles
- Litvinchuk Yulia (Chernivtsi University, 2012-2013)
Voter model with continuous number of states

Supervision of bachelor students:

- Nhat Anh Nguyen (Hamburg University, 2021-2022)
SDEs for sticky-reflected dynamics
- Mathilda Schwarz (Hamburg University, 2020-2021)
Scaling limits for critical inhomogeneous random graphs

- Pazuks Oksana (Chernivtsi University, 2012-2013)
Asymptotic behaviour of a particle model with annihilation
- Romaniuk Tetiana (Chernivtsi University, 2012-2013)
A particle model with reflecton
- Litvinchuk Yulia (Chernivtsi University, 2011-2012)
On a rescaling limit of voter model

Organizer of mathematical circles and reading seminars:

- Mathematical circle *Chernivtsi University*
 “*Interesting Problems of Probability and Theory of Stochastic Processes*” *SS 2011*
- Reading seminar *Institute of Mathematics of NASU*
 “*Stochastic Flows and Stochastic Differential Equations*” *SS 2010*