

# Andrey Sarantsev

University of Nevada, Reno

Department of Mathematics & Statistics

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## RESEARCH INTERESTS

### **Probability Theory, Mathematical Statistics, Quantitative Finance**

Random particle systems interacting through ranks; long-term stability of stochastic processes; concentration of measure for stochastic equations; systemic financial risk; financial econometrics; retirement planning; risk theory and ruin probability; stochastic portfolio theory; forest dynamics

## EMPLOYMENT

### **University of Nevada, Reno (UNR)**

Department of Mathematics and Statistics

Assistant Professor (tenure-track), 2018–now

### **University of California, Santa Barbara (UCSB)**

Department of Statistics and Applied Probability

Visiting Assistant Professor, 2015–2018

**Mentor:** JEAN-PIERRE FOUQUE. Partially supported by his NSF grant DMS 1409434

## EDUCATION

### **University of Washington, Seattle**

Ph.D. in Mathematics, 2010–2015

**Adviser:** SOUMIK PAL. **Thesis:** Competing Brownian Particles

### **Lomonosov Moscow State University, Moscow, Russia**

Specialist (Master's equivalent) with Honors in Mathematics, 2005–2010

**Undergraduate Mentor:** VLADIMIR PITERBARG

### **57th mathematics high school**

Top math high school in Moscow, Russia, 2001–2005

## RESEARCH ADVISING

**Ph.D. students:** Abraham Atsiwo, Jihyun Park, Hayden Brown (current); Kwame Boamah-Addo (former)

**M.S. students:** Hayden Brown (former)

**Undergraduate students:** 10 former students

## PUBLISHED ARTICLES

1. Birth and Death Processes in Interactive Random Environments (2022).  
With GUODONG PANG and YURI SUHOV. *Queueing Systems* **102** (1–2), 269–307.  
Available at arXiv:2203.10411.
2. Transient Behaviors of Single-Server Queues with Diffusive Rates (2022).  
With GUODONG PANG and YURI SUHOV. *Queueing Systems* **100** (3–4), 333–335.
3. Penalty Method for Obliquely Reflected Diffusions (2021).  
*Lithuanian Mathematical Journal* **61** (4), 518–549. Available at arXiv:1509.01777.
4. Optimal Portfolio with Power Utility for Absolute and Relative Wealth (2021).  
*Statistics & Probability Letters* **179** 109225. Available at arXiv:2105.0813.

5. A Stock Market Model Based on CAPM and Market Size (2021).  
BRANDON FLORES, BLESSING OFORI-ATTA. *Annals of Finance* **17** (3), 405–424.  
Available at arXiv:1907.08911.
6. Sub-exponential Rate of Convergence to Equilibrium for Processes on the Half-line (2021).  
*Stat. Probab. Let.* **175** 109115. Available at arXiv:2003.10614.
7. Time Series Analysis of Forest Dynamics at the Ecoregion Level (2020).  
With OLGA RUMYANTSEVA and NIKOLAY STRIGUL. *Forecasting* **2** (3), 364–386.
8. Convergence Rate to Equilibrium in Wasserstein Distance for Reflected Jump–Diffusions (2020).  
*Stat. Probab. Let.* **165** 108860. Available at arXiv:2003.10590.
9. Stationary Distributions and Convergence for M/M/1 Queues in Interactive Random Environment (2020). With YANA BELOPOLSKAYA, GUODONG PANG, and YURII SUHOV. *Queueing Systems* **94** (3–4), 357–392. Available at arXiv:1902.03941.
10. A Note on Jump Atlas Models (2020).  
With CLAYTON BARNES. *Bernoulli* **34** (4), 844–857. Available at arXiv:1610.04323.
11. Autoregression Modeling of Forest Dynamics (2019).  
With OLGA RUMYANTSEVA and NIKOLAY STRIGUL.  
*MDPI Forests* **10** (12), 1074. Available at arXiv:1911.09182.
12. Exponential Convergence Rate of Ruin Probabilities for Level-Dependent Lévy-Driven Risk Processes (2019). With PIERRE-OLIVIER GOFFARD. *J. Appl. Probab.* **56** (4), 1244–1268.  
Available at arXiv:1710.01845.
13. Talagrand Concentration Inequalities for Stochastic Partial Differential Equations (2019).  
With DAVAR KHOSHNEVISAN. *SPDE Anal. Comp.* **7** (4), 679–698. Available at arXiv:1709.07098.
14. Stationary Distributions and Convergence of Walsh Diffusions (2018).  
With TOMOYUKI ICHIBA. *Bernoulli* **25** (4A), 2439–2478. Available at arXiv:1706.07127.
15. Dynamic Contagion in a Banking System with Births and Defaults (2019).  
With TOMOYUKI ICHIBA and MICHAEL LUDKOVSKI.  
*Ann. Finance* **15** (4), 489–538. Available at arXiv:1807.08987.
16. Comparison Techniques for Competing Brownian Particles (2019).  
*J. Th. Probab.* **32** (2), 545–585. Available at arXiv:1305.1653.
17. Brownian Particles with Rank-Dependent Drifts: Out-of-Equilibrium Behavior (2019).  
With MANUEL CABEZAS, AMIR DEMBO, VLADAS SIDORAVICIUS.  
*Comm. Pure Appl. Math.* **72** (7), 1424–1458. Available at arXiv:1708.01918.
18. Large Rank-Based Models with Common Noise (2019).  
With PRAVEEN KOLLI. *Stat. Probab. Let.* **151**, 29–35. Available at arXiv:1802.06202
19. A Note on Transportation Cost Inequalities for Diffusions with Reflections (2019).  
With SOUMIK PAL. *Electr. Comm. Probab.* **24** (21), 1–11. Available at arXiv:1808.02164.
20. Modeling Systemic Risk with Interbank Flows, Borrowing, and Investing (2018).  
With ADITYA MAHESHWARI. *Risks* **6** (4), 1–26. Available at arXiv:1707.03542.
21. Weak Convergence of Obliquely Reflected Diffusions (2018).  
*Ann. Inst. H. Poincaré* **54** (3), 1408–1431. Available at arXiv:1509.01778.
22. Multiple Collisions in Systems of Competing Brownian Particles (2018).  
With CAMERON BRUGGEMAN. *Bernoulli* **24** (1), 156–201. Available at arXiv:1309.2621.
23. Infinite Systems of Competing Brownian Particles (2017).  
*Ann. Inst. H. Poincaré* **53** (4), 2279–2315. Available at arXiv:1403.4229.
24. Yet Another Condition for Absence of Collisions for Competing Brownian Particles (2017).  
With TOMOYUKI ICHIBA. *Electr. Comm. Probab.* **22** (8), 1–7. Available at arXiv:1608.07220.

25. Stationary Gap Distributions for Infinite Systems of Competing Brownian Particles (2017).  
With LI-CHENG TSAI. *Electr. J. Probab.* **22** (56), 1-20. Available at arXiv:1608.00628.
26. Reflected Brownian Motion in a Convex Polyhedral Cone: Tail Estimates for the  
Stationary Distribution (2017). *J. Th. Probab.* **30** (3), 1200-1223. Available at arXiv:1509.01781.
27. Two-Sided Infinite Systems of Competing Brownian Particles (2017).  
*ESAIM Probab. Stat.* **21**, 317-349. Available at arXiv:1509.01859.
28. Explicit Rates of Exponential Convergence for Reflected Jump-Diffusions on the Half-Line (2016).  
*ALEA Lat. Am. J. Probab. Math. Stat.* **13** (2), 1069-1093. Available at arXiv:1509.01783.
29. Penalty Method for Reflected Diffusions on the Half-Line (2016).  
With CAMERON BRUGGEMAN. *Stochastics* **89** (2), 485-509. Available at arXiv:1509.01776.
30. Diverse Market Models of Competing Brownian Particles with Splits and Mergers (2016).  
With IOANNIS KARATZAS. *Ann. Appl. Probab.* **26** (3), 1329-1361. Available at arXiv:1404.0748.
31. Triple and Simultaneous Collisions of Competing Brownian Particles (2015).  
*Electr. J. Probab.* **20** (29), 1-28. Available at arXiv:1401.6255.
32. On a Class of Diverse Market Models (2014).  
*Ann. Finance* **10** (2), 291-314. Available at arXiv:1301.5941.

## OTHER MANUSCRIPTS

1. IID Time Series Testing (2022).  
Available at arXiv:2203.10405.
2. Modified Method of Moments for Generalized Laplace Distributions (2022).  
With ADRIAN FISCHER and ROBERT E. GAUNT. Available at arXiv:2203.10775.
3. A New Stock Market Valuation Measure with Applications to Equity-Linked Annuities (2022).  
Available at arXiv:1905.04603
4. Partisan Lean of States: Electoral College and Popular Vote (2019).  
With RICHARD FOOTE, GRANT SCHISLER. Available at arXiv:1905.04444.
5. Laguerre and Jacobi Analogues of the Warren Process (2017).  
**Appendix** for the paper by YI SUN. Available at arXiv:1610.01635.

## FELLOWSHIPS AND AWARDS

2010	Academic Excellence Award, McKibben & Merner Fellowship for passing Preliminary Exams
2010	Top Report Award on the 17th International Conference “Lomonosov-2010”
2005–2010	Academic Fellowship, Lomonosov Moscow State University (7 times)
2002, 2005	Honorable Mention, Moscow Mathematical Olympiad

## TEACHING EXPERIENCE

### **University of Nevada, Reno:**

Differential Equations, Statistics & Probability for Engineers, Probability Theory, Stochastic Processes (undergraduate), Probability Theory, Time Series (Ph.D. level)

### **University of California, Santa Barbara:**

Probability Theory, Stochastic Processes (undergraduate)

### **University of Washington:**

**Instructor:** Multivariable and Vector Calculus (III and IV), Differential Equations, Matrix Algebra, Linear Analysis, Probability I (undergraduate)

**Teaching Assistant:** REU Program in Inverse Problems

**Homework Grader:** Real Analysis (Ph.D. level)

**Quiz Sections Instructor:** Multivariable Calculus (Calculus III)

### RESEARCH TALKS

- 2022 University of Texas, Dallas; University of Utah
- 2021 Frontier Probability Days (University of Nevada Las Vegas)
- 2020 University of Montana; Joint Mathematics Meeting; University of Mississippi; Washington State University; Penn State University; European Seminar in Computing; Computational & Methodological Statistics
- 2019 American Statistical Association Nevada Sectional Meeting; INFORMS Annual Meeting
- 2018 Florida State University; Cornell University; Carnegie Mellon University; California State University, Los Angeles; University of Nevada, Reno; Frontier Probability Days; University of Minnesota; UCSB; University of Washington; AMS Western and Eastern Fall Sectional Meetings
- 2017 AMS Western, Southwestern, and Central Fall Sectional Meetings; INFORMS Annual Meeting in Houston; Center for Financial Mathematics & Actuarial Research (UCSB) 10th anniversary conference; University of Utah; UCSB; Boston University; 9th Western Conference in Mathematical Finance; Seminar on Stochastic Processes; University of Maryland, College Park; University of Delaware; AMS Central Spring Sectional Meeting; University of Washington
- 2016 SIAM Conference in Financial Mathematics; Michigan State University; Carnegie Mellon University; Oregon State University; University of Washington; University of Illinois, Chicago; Princeton University; Columbia University; City University of New York
- 2015 Southern California Probability Symposium; University of Southern California; UCSB
- 2014 Columbia University; Seminar on Stochastic Processes; UCSB

### LANGUAGES AND SOFTWARE

**Languages:** English (fluent), Russian (native)

**Coding:** MATLAB, C, Python, R

**Editors:**  $\LaTeX$ , HTML

### PERSONAL INFORMATION

Born October 9, 1989, in Moscow, Russia

Citizenship: Russian

USA Permanent Resident (Green Card)

Updated January 27, 2023