

# Alexey A. Naumov

Skolkovo Institute of Science and Technology, Skolkovo  
Innovation Center, Building 3, Moscow, 143026, Rus-  
sian Federation

Home address: Ibragimova str., 5 bld. 1, apt. 37,  
Moscow, 105318, Russian Federation

Phone: +7 925 287 92 97

Email: [a.naumov@skoltech.ru](mailto:a.naumov@skoltech.ru)

## Personal

Born on August 22, 1988.

Russian Federation Citizen.

## Education

*Candidate of science (Physics and Mathematics)*

Moscow State University Faculty of Computational Mathematics and Cybernetics (advisor: Prof. Dr. Vladimir Ulyanov; title of the thesis: "Limit theorems for random matrices with dependent entries"), 2010 – 2013.

*PhD*

Bielefeld University, Faculty of Mathematics (advisor: Prof. Dr. Friedrich Götze; title of the thesis: "Universality of some models of random matrices and random processes"; honour: summa cum laude), 2012 – 2013.

*M.S.*

Moscow State University, Faculty of Computational Mathematics and Cybernetics (advisor: Prof. Dr. Vladimir Ulyanov; final research: "Strong law of large numbers for random processes"; degree with honour; won diploma thesis competition), 2005 – 2010.

## Academic Career

*Senior Research Scientist*

Skolkovo Institute of Science and Technology (Skoltech), Center for Computational Data-Intensive Science and Engineering (CDISE), 2016 – current.

*Senior Research Scientist*

IITP RAS, Sector 7 – Mathematical Methods of Predictive Modelling, 2015 – current.

*Associate Professor*

Higher School of Economics, Faculty of Computer Science, 2016 – current.

*Assistant Professor*

Moscow State University, Faculty of Computational Mathematics and Cybernetics, Department of Mathematical Statistics, 2013 – 2016 ( previous positions: Researcher).

## Business Experience

PFL Advisors (shareholder; development of currency risk hedging model), 2010 – current

*Hedge-fund Quantitative Analyst*

Aton Capital Management (development of quantitative trading strategies; equity, bonds, FX, derivatives trading) 2011–2014.

*Market Risk Analyst*

Raiffeisen bank (development of mathematical models of interest rate and FX derivatives valuation), 2010–2011.

## Research Interests

Random matrix theory, high-dimensional probability and statistics, stochastic analysis, applied statistics.

## Teaching Experience

*Skolkovo Institute of Science and Technology*

Modern random matrix theory, Fall 2017.

Principles of applied statistics, Spring 2018.

*Higher School of Economics, Faculty of Computer Science:*

Probability theory and mathematical statistics, 2016 – current.

Random matrix theory, Fall 2016.

*Moscow State University, Faculty of Computational Mathematics and Cybernetics:*

Probability theory and mathematical statistics, 2013 – 2016.

Mathematical foundation of probability theory, 2013 – 2016.

Applied statistics, Spring 2015.

Random matrix theory and free probability, Fall 2014.

## Research grants

*Current projects:*

RFBR grant 16-31-00005 "Spectral analysis of large dimensional random matrices", 2016–2017, 0.45m RUB (Skoltech).

Presidents of Russian Federation Grant for young scientists N 4596.2016.1 "Local laws for random matrices and universality of local spectral statistics", 2016–2017, 0.6m RUB, (Skoltech).

*Past projects:*

German Research Foundation (DFG) grant through the International Research Training Group IRTG 1132, 2012–2013, 30k EUR (Bielefeld University, Germany).

DAAD grant, 2011–2012, 5k EUR (Bielefeld University, Germany).

*As a Principal investigator:*

RFBR grant N 14-01-00500 Limit theorems for random matrices and their applications, 2014–2016, 0.5m RUB, lead by Prof. A. Tikhomirov (Komi SC RAS);

RSCF grant N 14-11-00196 Non-linear stochastic analysis: differential and stochastic properties of distributions, 2014–2016, 5m RUB, lead by Prof. V. Bogachev (Moscow State University).

RSCF grant N 14-11-00364 Modern analytical methods of probability theory and mathematical statistics oriented on analysis of high dimensional data, 2014–2016, 4.5m RUB, lead by Prof. V. Korolev (Moscow State University).

**Awards, scholarships**

Moscow State University scholarship for young scientists, 2016.

First award on 39-th competition of young scientists of Moscow State University, 2015.

Winner of the All-Russian competition Marked Work of a Younger Researcher in the Field of Applied and Industrial Mathematics, 2015.

Simons Foundation scholarship, 2013.

Rosgosstrakh (RGS) scholarship, 2009–2010.

**Professional memberships**

The Bernoulli Society for Mathematical Statistics and Probability, 2009 – current.

Member of the Council of young scientists of Faculty of computational mathematics and cybernetics, 2014–2015, 2016 – current.

**Professional activities***Conferences, workshops:*

Organizer of the section "High-dimensional probability" on the 39th Conference on Stochastic Processes and their Applications (SPA2017), 24–28 July 2017, Moscow.

Member of the Program Committee of the International Workshop "Investigating Physical Systems: Group Theoretical Methods", 21–23 September, Institute of Physics and Mathematics Komi Science Centre, UrB RAS, 2017.

Co-organizer of the International Scientific Conference "Probability Theory and its Applications" on Occasion of the 85-th Birthday of Yu.V.Prokhorov, 12–14, February, 2014, Moscow.

*Digital student contests:*

Co-organizer of the Digital contest in applied mathematics and computer science for Faculty of computational mathematics and cybernetics of Moscow State University (approx. 2'000 participants, 150 winners became master students of the faculty), 2015–2016.

Co-organizer of the International digital student contest "Olympiad 3K" in applied mathematics, applied economics and technology for the defence industry and civilian enterprises (approx. 50'000 participants with winners received job-offers from Russian technological companies), 2015.

Co-organizer of the International digital student contest "FinOlymp" in finance (approx. 12'000 participants with winners employed by global financial institutions), 2009/2010, 2011, 2012/2013.

## Advising undergraduate students

Marat Seifullin (M.S., MSU), Aleksei Miroshnichenko (BSc, MSU), Artem Taran (BSc, MSU), Radomir Britkov(BSc, MSU), Yuri Tavyrikov (BSc, MSU; M.S., Skoltech), Valentina Shumovskay (BSc, MSU).

## Conference talks

Beijing International Symposium on Probability Theory, Beijing, China, 2017, expected.

Function theory and dynamics of point processes, Saint Petersburg, Russia, 2017, expected.

ProbabLY ON Random matrices, Lyon, France, 2017.

Wokshop "Analysis, Geometry and Probability", Moscow, Russia, 2016.

Information Technology and Systems 2016, The 40th Interdisciplinary Conference and School, Repino, Saint Petersburg, Russia.

Random product matrices: new developments and application, Bielefeld, Germany, 2016.

Randomness in physics and mathematics, Bielefeld, Germany, 2016.

2nd Russo-Indian Joint Conference in Statistics and Probability, Saint Petersburg, Russia.

The IX International Petrozavodsk Conference "Probabilistic Methods in Discrete Mathematics", Petrozavodsk, Russia, 2016.

Workshop on modern statistics and optimization, Moscow, Russia (mini-course lecturer), 2016.

Yu.V.Linnik Centennial Conference Analytical methods in number theory, probability theory and mathematical statistics, Saint Petersburg, Russia, 2015.

Group representations in dynamical systems and geometry, Luminy, France, 2015.

International conference "Probability Theory and its Applications" on occasion of the 85-th Birthday of Yu.V.Prokhorov, Moscow, Russia, 2015.

Workshop Probability, analysis and geometry, Moscow, Russia, 2014.

Free probability and random matrices, Bielefeld, Germany, 2014.

CracowRMT 2014: Random Matrix Theory: Foundations and Applications, Cracow, Poland, 2014.

Randomness in physics and mathematics, Bielefeld, Germany, 2013.

Stochastic and Real World Models: Recent Progress and New Frontier, Bielefeld, Germany, 2013.

International conference Lomonosov-2013, Moscow, Russia, 2013.

Stochastic and Real World Models: Recent Progress and New Frontier, Xuzhou, China, 2012.

International conference Lomonosov-2012, Moscow, Russia, 2012.

The Satellite Summer School to the Sixth International Conference on Lévy Processes, Braunschweig, Germany, 2010.

International conference Lomonosov-2009, Moscow, Russia, 2009.

Russian Japan symposium on stochastic analysis of the advanced statistical models, Moscow, Russia, 2009.

## Scientific visits and fellowships

### *Fellowships and long term visits:*

Bielefeld University, Faculty of mathematics, regular guest of Prof. Friedrich Götze, 2011–current.

Chinese University of Hong Kong, Department of Statistics, Hong Kong, guest of Prof. Qi-Man Shao, Sep – Dec, 2015.

### *Short term visits:*

Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany, regular guest of Prof. Vladimir Spokoiny, 2015–current.

Department of Mathematics, University of Southern California, guest of Prof. Larry Goldstein, Nov. 2017, expected.

School of Mathematics, Institute of Technology, University of Minnesota, guest of Prof. Sergey Bobkov, Nov. 2017, expected.

Ruhr-University Bochum, guest of Prof. Peter Eichelsbacher, Jul. 2017, expected.

Institute of Science and Technology Austria, guest of Prof. Laszlo Erdős, Apr, 2017.

Duisburg–Essen University, Faculty of Mathematics, Essen, Germany, guest of Prof. Denis Belomestny, Jan, Jul. 2017.

Hong Kong University of Science and Technology, Hong Kong, guest of Prof. Bing-Yi Jing, Nov, 2015.

University of Science and Technology of China, Hefei, China, guest of Prof. Dr. Hu Taizhong, Nov, 2013 .

Zhejiang University, Hangzhou, China, guest of Prof. Zhengyan Lin, Oct Nov, 2013.

Otto-von-Guericke-Universitt Magdeburg, Magdeburg, Germany, guest of Prof. Gerd Christoph, Jul, 2012 .

University of Zurich, Zurich, Switzerland, guest of Prof. Ashkan Nikeghbali, Feb, 2012.

## Submitted publications

- [1] A. Naumov, V. Spokoiny and V. Ulyanov. Bootstrap confidence sets for spectral projectors of sample covariance, submitted to *Annals of Statistics* (see also ArXiv:1703.00871).

## Published/accepted

- [1] F. Götze, A. Naumov, A. Tikhomirov. Distribution of linear statistics of singular values of the product of random matrices. *Bernoulli*, 23(4B), 3067–3113, 2017, DOI: 10.3150/16-BEJ837 (see also ArXiv:1412:3314).
- [2] F. Götze, A. Naumov and A. Tikhomirov. Local Semicircle law under moment conditions: Stieltjes transform, rigidity, delocalization. *Probab. Theory and Appl.*, 62 (1), 72–103, 2017, DOI: 10.4213/tvp5092.
- [3] F. Götze, A. Naumov, A. Tikhomirov and D. Timushev. On the local semicircle law for Wigner ensembles. *Bernoulli*, to appear (see also ArXiv: 1602.03073).
- [4] F. Götze, A. Naumov, A. Tikhomirov and D. Timushev. Local Semicircle Law under Weak Moment Conditions. *Doklady Mathematics*, 93 (3), 1–3, 2016, DOI:10.1134/S1064562416030029.
- [5] F. Götze, A. Naumov, and V. Ulyanov. Asymptotic analysis of symmetric functions. *Journal of Theoretical Probability*, to appear, DOI:10.1007/s10959–016–0679–3 (see also ArXiv:1502.06267).
- [6] F. Götze, A. Naumov, and A. Tikhomirov. On a generalization of the elliptic law for random matrices. *Acta Phys. Polon. B*, 46 (9), 1737–1745, 2015, DOI:10.5506/APhysPo1B.46.1737 (see also ArXiv:1404:7013).

- [7] F. Götze, A. Naumov, and A. Tikhomirov. On minimal singular values of random matrices with correlated entries. *Random Matrices Theory Appl.*, 4 (2), 1550006, 30, 2015, DOI:10.1142/S2010326315500069 (see also ArXiv:1309:5711).
- [8] A. Naumov. Limit theorems for two classes of random matrices with Gaussian elements. *Journal of Mathematical Sciences*, 204(1):140–147, 2014, DOI:10.1007/s10958-014-2192-5
- [9] F. Götze, A. Naumov, and A. Tikhomirov. Limit theorems for two classes of random matrices with dependent entries. *Theory Probab. Appl.*, 59 (114)(1):23–39, 2015, DOI:10.1137/S0040585X97986916 (see also Semicircle law for a class of random matrices with dependent entries, ArXiv:1211.0389).
- [10] A. Naumov. Elliptic law for random matrices. *Vestnik Moskov. Univ. Ser. XV Vychisl. Mat. Kibernet.*, (1):31–38, 2013. (see also Elliptic law for real random matrices, ArXiv:1201.1639).
- [11] A. Naumov. Strong law of large numbers for martingales and random processes with independent increments. *Probab. Theory and Appl.*, 55(3), 550–551, 2011, DOI:10.1137/S0040585X97985054
- [12] A. Naumov. The strong law of large numbers for random processes. *Vestnik Moskov. Univ. Ser. XV Vychisl. Mat. Kibernet.*, 52(1), 34–39, 2010.

## Preprints

- [1] F. Götze, A. Naumov, and A. Tikhomirov. Local semicircle law under moment conditions. Part I: The Stieltjes transform, ArXiv:1510.07350, 2015.
- [2] F. Götze, A. Naumov, and A. Tikhomirov. Local semicircle law under moment conditions. Part II: Localization and delocalization. ArXiv:1511.00862, 2015.

## References

Prof. Dr. Friedrich Götze,  
Bielefeld University,  
Email: [goetze@math.uni-bielefeld.de](mailto:goetze@math.uni-bielefeld.de)

Prof. Dr. Vladimir Ulyanov,  
Moscow State University,  
Email: [vulyan@cs.msu.ru](mailto:vulyan@cs.msu.ru)

Prof. Dr. Alexander Tikhomirov,  
Komi Research SC, RAS,  
Email: [tikhomirov@dm.komisc.ru](mailto:tikhomirov@dm.komisc.ru)

Prof. Dr. Vladimir Spokoyny,  
WIAS, Skoltech,  
Email: [spokoyny@wias-berlin.de](mailto:spokoyny@wias-berlin.de)