Liubov TUPIKINA

Curriculum Vitae

Professional Experience

2016–2017 **Post-doc research**, *Ecole Polytechnique, Laboratoire de Physique de la Matiere Condensee, Palaiseau*, FRANCE, group of Prof.Denis Grebenkov.
Subject: Anomalous diffusion properties, intracellular transport, irregular systems

2012–2016 **PhD in Physics**, *Humboldt Universität, Berlin, Potsdam Institute fur Klimafolgenforschung, Potsdam,* GERMANY, Marie-Curie Research Fellowship Program, Project LINC, supervisor: Prof.Jürgen Kurths (Physics Department, HU, Transdisciplinary Concepts and Methods Department, PIK).
Thesis Referees: Prof.Schimansky-Geier, Prof.Sokolov, Prof.Nechaev, Prof.Kurths, Prof.Masselink, Subject: *"Temporal and spatial aspects of correlation networks and dynamical network models: analytical approaches and physical applications"*

2006–2012 **Master degree in Mathematics**, *Lomonosov Moscow State University, Moscow,* RUSSIA, supervisor: Prof. Helen Bunina (Chair of Higher Algebra, Department of Mechanics end Mathematics).
Subject: *"Authomorphisms of the semigroup of nonnegative invertible matrices"*

Research Interests

Physics stochastic processes; statistical physics of complex systems: random structures, quenched disorder; various types of diffusion processes; particle dynamics in porous media; big data analysis; random walks theory

Mathematics graph theory, co-evolutionary network models: dynamics on adaptive networks, agent-based models; dynamical systems theory; geometric theory of differential equations

Biology cell dynamics: intracellular transport; transport of plankton in the ocean

Education

2012 – 2016 PhD courses in statistical and quantum physics in Physics department, **Humboldt Universität**, Berlin, Germany

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2017 Collaboration with French-Russian Poncelet lab, Moscow Independent Mathematical Institute, Russia

2012–2016 Courses in Nonlinear dynamics, Complex networks, Statistical physics, Physics Department of Humboldt Universität, Berlin, Germany

2013-2014 Internship in **Institute of Complex Systems (IFISC)**, Palma de Mallorca, Spain, LINC European project

2014 Internship in **Utrecht University**, the Netherlands, LINC European project

2014 Internship in **University of Montevideo**, Uruguay, LINC European project

2012-2015 Research project on data analysis in Department of Transdisciplinary Concepts and Methods, **Potsdam Klimafolgenforschung Institute**, Potsdam, Germany

2006 – 2012 Master courses in Mathematics and data analysis, **Lomonosov Moscow State University**, Chair of Higher Algebra, Department of Mechanics and Mathematics, Moscow, Russia

2004 – 2006 Physical-Mathematical Lyceum 1511, Lyceum of Moscow Institute of Physics and Engineering, Moscow, Russia

Publications

- 1. H.Bunina, **L.Tupikina**, "Authomorphisms of the semigroup of nonnegative invertible matrices of order 2 over rings", Journal of Mathematical Sciences, 183, 305-313 (2012)
- 2. **L.Tupikina**, K.Rehfeld, N. Molkenthin, V.Stolbova, N. Marwan, and J.Kurths, "Characterizing the evolution of climate networks", Nonlin. Processes Geophys., 21, 705-711 (2014)
- 3. N.Molkenthin, K. Rehfeld, V. Stolbova, **L.Tupikina** and J. Kurths, "On the influence of spatial sampling on climate networks", Nonlin. Processes Geophys., 21, 651-657 (2014)
- 4. J.F. Donges, J. Heitzig, B. Beronov, M. Wiedermann, J. Runge, Q.-Y. Feng, **L.Tupikina**, V. Stolbova, R.V. Donner, N. Marwan, H.A. Dijkstra, and J. Kurths, "Unified functional network and nonlinear time series analysis for complex systems science: The pyunicorn package", Chaos 25, 113101-1-25 (2015)
- 5. **L.Tupikina**, N.Molkenthin, C.Lopez, E.Hernandez-Garca, N.Marwan and J.Kurths, "Correlation networks from flows. The case of forced and time-dependent advection-diffusion dynamics", Plos One, 0153703 (2016)
- 6. N.Molkenthin, H.Kutza, **L.Tupikina**, N.Marwan, J.Donges, U.Feudel, J.Kurths, R.Donner, "A geometric perspective on spatially embedded networks. Quantification of edge anisotropy and application to flow networks", Chaos accept.
- 7. **L.Tupikina,** J.Heitzig, J.Kurths, "Heterogeneous opinion state model on tree graphs", in prep.

Awards

2017 CNRS stipendium at Ecole Polytechnique

2011 DAAD-stipendiat, Humboldt University, Berlin, Germany

2007 Second price, Student competition in the Theoretical Mechanics, Moscow State University, Moscow, Russia

2006 First price in Young researchers Conference, Mechanics, Moscow Institute of Physics and Engineering, Russia

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2006 First price in Young researchers Conference, Mathematics, International Conference, Intel, Moscow Institute of Physics and Engineering, Indianapolis, USA

Some Talks at Conferences and Workshops

2017 Oral Presentation "Where do we get using random walk theory", **JSTAT Conference**, Paris, France

2016 Oral Presentation "Correlation network and graph dynamical models" at Conference of Complex Systems, Amsterdam, the Netherlands

2016 Oral Presentation "Where do we come using random walks theory?", **Seminar on algebraic theory**, Moscow University, Russia

2015 Oral presentation "Flow-networks methods: applications to opinion dynamics", German Physical Society Meeting, **DPG**, Berlin, Germany

2014 Oral Presentation "Flow-networks analysis of flow systems: Eulerian and lagrangian approaches", **conference of Graph theory applications**, MSU, Russia

2014 Oral Presentation "Temporal and spatial aspects of correlation networks", **CCS**, Lucca, Italy

2014 Oral presentation "Flow networks. Applications for Ocean currents. Transition to the chaotic regimes in the flows", **South American Conference WCRP**, Montevideo, Uruguay

2013 Oral Presentation "Climate, Paleoclimate and Flow networks: methods of network analysis" **Marie-Curie School, LINC project**, Utrecht (UU), the Netherlands

2013 Oral presentation "Spatial and Temporal aspect of networks" at **CONIM seminar** on data analysis, PIK, Potsdam, Germany

Computer skills

Python Scientific programming, Wolfram Mathematica

Matlab, html, LaTeX, OpenOffice, Linux, Microsoft Windows

Scientific Outreach and Other Activities

2016-2017 "Complex networks" conference, Milan, Italy, articles reviewer

2016-2017 "Critical and collective effects in networks" conference, Moscow, Russia, co-organiser

2015 Collection of database and Outreach activity for Marie-Curie LINC project

2012 Professor of Mathematical analysis course, Russian Academy of Trade, Moscow, Russia

Languages

- Russian (Mothertongue)
- German(Fluent)
- French (Basic)
- English (Fluent)
- Spanish (Basic)

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