Alexey Okunev

CONTACT INFORMATION

Pennsylvania State University
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RESEARCH INTERESTS

Dynamical systems, perturbations of Hamiltonian systems, averaging method, attractors, skew products, partial hyperbolicity, experimental mathematics.

EDUCATION

Higher School of Economics

Ph.D. in Mathematics, October 2017

- Dissertation Topic: Attractors of Skew Products
- Advisor: Yulij Ilyashenko

Moscow State University

B.S and M.S. in Mathematics, 2013.

Yandex School of Data Analysis

M.S. in Data Analysis.

APPOINTMENTS

August 2022 - August 2023. Pennsylvania State University, One year visiting program (postdoc).

April 2019 - May 2022 Loughborough University (UK), Research Associate (postdoc). Supervisor Anatoly Neishtadt.

VISITING POSITIONS

June 2016. University of Porto, Short term visitor.

Fall 2014. ENS Lyon, Visiting graduate student.

PREPRINTS

A. Neishtadt, A. Okunev, *Averaging and passage through resonances in two-frequency systems near separatrices,* arXiv:2108.08540

V. Kleptsyn, Yu. Kudryashov, A. Okunev, *Classification of generic semigroup actions of circle diffeomorphisms,* arXiv:1804.00951

PUBLICATIONS

A. Neishtadt, A. Okunev, *Phase change and order 2 averaging for one-frequency systems with separatrix crossing,* **Nonlinearity**, 35.8 (2022): 4469. arXiv:2003.05828

C. Bonatti, S. Minkov, A. Okunev, I. Shilin, *A C^1 Anosov diffeomorphism with a horseshoe that attracts almost any point,* **Discrete & Continuous Dynamical Systems**, 40.1 (2020): 441. arXiv:1802.03977

A. Okunev, *Milnor Attractors of Skew Products with the Fiber a Circle,* **Journal of Dynamical and Control Systems**, 23:2 (2017): pp. 421-433. arXiv:1508.02132

S. Minkov, A. Okunev, *Omega-limit sets of generic points of partially hyperbolic diffeomorphisms,* **Functional Analysis and Its Applications**, 50.1 (2016): 48-53.

A. Okunev and I. Shilin, *On the attractors of step skew products over the Bernoulli shift,* **Proceedings of the Steklov Institute of Mathematics**, 297 (2017): 260-280. arXiv:1703.01763

V. Kleptsyn, A. Okunev, I. Schurov, D. Zubov, M. I. Katsnelson, *Chiral tunneling through generic one-dimensional potential barriers in bilayer graphene*, **Phys. Rev. B**, 92:16 (2016), 165407 arXiv:1507.07638

Conference Talks

On the phase change for perturbations of one-frequency systems with separatrix crossing, Regular and Chaotic Dynamics, Moscow, Russia (November 2021).

Averaging and passage through resonances in two-frequency systems near separatrices, Topological Methods in Dynamics and Related Topics, Nizhny Novgorod, Russia (August 2021).

On the phase change for perturbations of Hamiltonian systems with separatrix crossing, Topological Methods in Dynamics and Related Topics, Nizhny Novgorod, Russia (December 2020).

Generic iterated function systems on the circle, Dynamics Days Europe, Loughborough, UK (September 2018).

A C^1 Anosov diffeomorphism with a horseshoe that attracts almost any point, Anosov Systems and Modern Dynamics, Moscow, Russia (December 2016).

Generic iterated function systems on the circle, Dynamics, Bifurcations, and Strange Attractors, Nizhny Novgorod, Russia (July 2016).

Attractors of partially hyperbolic skew products with circle fiber, Dynamics, Bifurcations, and Strange Attractors, Nizhny Novgorod, Russia (July 2015).

Milnor attractors of circle skew products, Global Dynamics Beyond Uniform Hyperbolicity, Olmue, Chile (August 2015).

Seminar Talks

Averaging and passage through resonances in two-frequency systems near separatrices, Joint CERN-Bologna Theoretical Group seminar (February 2022).

Averaging and passage through resonances in two-frequency systems near separatrices, Ergodic Theory and Dynamical Systems seminar, University of Warwick (February 2022).

Averaging and passage through resonances in two-frequency systems near separatrices, DynamIC seminar, Imperial College, London (January 2022).

A C^1 Anosov diffeomorphism with a horseshoe that attracts almost any point, Dynamical Systems Seminar, Loughborough University (October 2019).

Classification of generic semigroup actions of circle diffeomorphisms, Dynamical Systems Seminar, University of Porto (June 2016).

Attractors for random dynamics on the circle, Internal seminar of UMPA, ENS-Lyon (November 2014).

Awards & Grants

HSE Academic scholarship (2013 - 2016)

Simons foundation scholarship (2014)

Mentorship

Evgeny Frolov, MSc thesis advisor, Skoltech, 2021/2022

Teaching and Grading

Pennsylvania State University

Calculus, Instructor, Fall 2022

Moscow Institute of Physics and Technology (Moscow, Russia)

Analytical Mechanics, Instructor, Spring 2017

Independent University of Moscow (Moscow, Russia)

Dynamical Systems, Lecturer, Fall 2016

Moscow School #57

- Individual mathematics mentorship in Linear Algebra, Geometry, Topology, Calculus, Set Theory. Students: Alexey Safin, Andrei Kozlov, Sofya Gendina, Alexander Lebedev, Anton Kudinov, Danil Krotkov (2010-2014; 2016-2018)
- Evening Mathematical School for 7th grade, instructor (2015)

Moscow Center for Continuous Mathematical Education

- Math Circle, 8th grade, Instructor, 2015-2016
- Math Circle, 7th grade, Instructor, 2014-2015; 2009-2010
- Math Circle, 6th grade, Instructor, 2013-2014; 2008-2009

Moscow Mathematical Olympiad

Member of Organizing committee, co-author of problem sets, Grader, 9th grade, 2011

Lomonosov Academic Tournament

Organizer, Proctor, Grader 2011, 2012

"Matprazdnik" Mathematics Olympiad for 6th-7th grades

Organizer, Proctor, Grader, 2010, 2012, 2017

Summer School Participation

Dynamical Systems, Dubna, Russia, 2011-2014, 2016, 2022

Dynamical Systems, Štôla, Slovakia, 2010

Modern Mathematics, Dubna, Russia, 2008-2010