

## Alexey Okunev

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CONTACT INFORMATION	Pennsylvania State University Department of Mathematics McAllister Building, Room 209 Pollock Rd State College, PA 16802	<a href="mailto:abo5297@psu.edu">abo5297@psu.edu</a> <a href="https://aokunev42.github.io/">https://aokunev42.github.io/</a>
RESEARCH INTERESTS	Dynamical systems, mathematical physics, perturbations of Hamiltonian systems, averaging method, attractors, skew products, partial hyperbolicity, experimental mathematics.	
EDUCATION	<b>Higher School of Economics</b> Ph.D. in Mathematics, October 2017 <ul style="list-style-type: none"><li>• Dissertation Topic: Attractors of Skew Products</li><li>• Advisor: Yulij Ilyashenko</li></ul> <b>Moscow State University</b> B.S and M.S. in Mathematics, 2013. <b>Yandex School of Data Analysis</b> M.S. in Data Analysis.	
APPOINTMENTS	August 2022 - present, Pennsylvania State University, Assistant Research Professor.  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	M. Levi, A. Okunev, <i>Thick Arnold tongues</i> , arXiv:2411.00175  A. Neishtadt, A. Okunev, <i>Averaging and passage through resonances in two-frequency systems near separatrices</i> , arXiv:2108.08540  V. Kleptsyn, Yu. Kudryashov, A. Okunev, <i>Classification of generic semigroup actions of circle diffeomorphisms</i> , arXiv:1804.00951	
PUBLICATIONS	Y. Gao, A. Neishtadt, A. Okunev, <i>On phase at a resonance in slow-fast Hamiltonian systems</i> , <b>Regular and Chaotic Dynamics</b> , 28.4 (2023): 585-612. arXiv:2212.13293  S. Minkov, A. Okunev, I. Shilin, <i>Attractors with Non-Invariant Interior</i> , <b>Moscow Mathematical Journal</b> , 23.4 (2023): 559-570. arXiv:2305.08582  A. Neishtadt, A. Okunev, <i>Phase change and order 2 averaging for one-frequency systems with separatrix crossing</i> , <b>Nonlinearity</b> , 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 *Averaging and passage through resonances in two-frequency systems near separatrices*, Summer School: Partial Hyperbolicity, University of Maryland, US (June 2023).

*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 *Thick Arnold tongues*, Dynamics seminar, University of Maryland (March 2024).

*Thick Arnold tongues*, Dynamical Systems seminar, Pennsylvania State University (September 2023).

*Averaging and passage through resonances in two-frequency systems near separatrices*,

Dynamical Systems seminar, Pennsylvania State University (February 2023).

*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 I, Instructor, Fall 2024, Fall 2023, Fall 2022  
Multivariable Calculus, Instructor, Spring 2024  
Linear Algebra, Instructor, Spring 2023

**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