

# Alexey Balitskiy

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## FIELDS OF INTEREST

Metric, systolic,  
convex, discrete,  
symplectic geometry

## EMPLOYMENT

### UNIVERSITY OF LUXEMBOURG

Aug 2023 – present | MSCA  
postdoctoral fellow

Department: Mathematics

### INSTITUTE FOR ADVANCED STUDY, PRINCETON

Sep 2021 – Jul 2023 | Member  
School: Mathematics

## EDUCATION

### MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Sep 2016 – Jun 2021 | PhD

Department: Mathematics

Advisor: Larry Guth

Thesis: Bounds on Urysohn width

### MOSCOW INSTITUTE OF PHYSICS AND TECHNOLOGY

Sep 2014 – Jun 2016 | Master

Sep 2010 – Jun 2014 | Bachelor

Department: Control and Applied  
Mathematics

Advisor: Roman Karasev

Thesis: Shortest closed billiard  
trajectories in convex bodies in  
connection with Viterbo's  
conjecture

### SCHOOL #11, ZHELEZNOGORSK, KURSK REGION, RUSSIA

Sep 1999 – Jun 2010

## LANGUAGES

Russian | mother-tongue  
English | fluent

## HOBBIES

Gongfu tea  
Kintsugi  
Choral singing  
Playing piano four hands  
Virtual & augmented reality

## SELECTED PAPERS AND PREPRINTS

- *Geometric bounds for persistence* (with B. Coskunuzer and F. Mémoli), arXiv preprint (2024)
- *Systolic almost-rigidity modulo 2* (with H. Alpert and L. Guth), to appear in J. Eur. Math. Soc.
- *Macroscopic scalar curvature and codimension 2 width* (with H. Alpert and L. Guth), to appear in J. Topol. Anal.
- *Systolic inequalities for the number of vertices* (with S. Avvakumov, A. Hubard and R. Karasev), to appear in J. Topol. Anal.
- *Waist of maps measured via Urysohn width* (with A. Berdnikov), Trans. Am. Math. Soc. 375.2 (2022): 1261–1279
- *Local-to-global Urysohn width estimates* (with A. Berdnikov), J. für die Reine und Angew. Math. (Crelles) 2021.780 (2021): 265–274
- *A multi-plank generalization of the Bang and Kadets inequalities*, Isr. J. Math. 245 (2021): 209–230
- *Flip cycles in plabic graphs* (with J. Wellman), Selecta Math. (N.S.) 26.1 (2020): 1–29
- *Equality cases in Viterbo's conjecture and isoperimetric billiard inequalities*, Int. Math. Res. Not. 2020.7 (2020): 1957–1978
- *On the circle covering theorem by A. W. Goodman and R. E. Goodman* (with A. Akopyan and M. Grigorev), Discrete Comput. Geom. 59.4 (2017): 1001–1009
- *Shortest closed billiard trajectories in the plane and equality cases in Mahler's conjecture*, Geom. Dedicata 184.1 (2016): 121–134
- *Billiards in convex bodies with acute angles* (with A. Akopyan), Israel J. Math. 216.2 (2016): 833–845
- *Elementary approach to closed billiard trajectories in asymmetric normed spaces* (with A. Akopyan, R. Karasev and A. Sharipova), Proc. Am. Math. Soc. 144.10 (2016): 4501–4513
- *Another Ham Sandwich in the Plane* (with A. Garber and R. Karasev), Ann. Comb. 19.2 (2015): 235–242

## DISTINCTION

- 2023 MSCA European postdoctoral fellowship
- Mar 2015 Laureate of Simons fellowship for students in Moscow
- Nov 2014 2<sup>nd</sup> place in 18<sup>th</sup> All-Russian Möbius Contest
- Jul 2014 First Prize at International Mathematics Competition for University Students | Bulgaria
- Apr 2010 Winner at All-Russian Mathematical Olympiad

## TEACHING & MENTORING

### TEACHING ASSISTANT | UNIVERSITY OF LUXEMBOURG

2023–present exercise classes in Analysis | Olympiad problem solving |  
EML mentorship | Bachelor seminar supervision

### SPUR MENTOR | MASSACHUSETTS INSTITUTE OF TECHNOLOGY

2020 E. Bullock and K. Gravel | *Higher secondary polytopes for 2D zonotopes*  
2018 J. Wellman | *Flips in reduced plabic graphs*

### RSI MENTOR | MASSACHUSETTS INSTITUTE OF TECHNOLOGY

2018 J. Choi | *Geometric complexity of planar drawings*

### TEACHING ASSISTANT | MASSACHUSETTS INSTITUTE OF TECHNOLOGY

2017–2021 recitation teacher: Convex optimization  
grader: Probability | Linear Algebra | Functional analysis |  
Quantum computation | Combinatorial optimization

### TEACHING ASSISTANT | MOSCOW INSTITUTE OF PHYSICS AND TECHNOLOGY

2014–2016 Combinatorics | Analysis | Algorithms | Discrete geometry