

# Nikita Kalinin

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clickable links:

## *Contacts*

gmail.com, nikaanspb

*Citizenship:* Russia.

*Birthday:* May 6, 1988.

personal web-page  
SPbU hse

mathscinet profile ORCID zbmath  
РИНЦ web of science scopus  
google scholar arxiv



Interests: tropical geometry, algebraic geometry, complex analysis, hyperbolic geometry, sandpiles, knots, number theory, graph theory, matroids, non-commutative geometry, auctions, teaching, mathematics in sociology and biology, pattern formation, history of mathematics and education.

## Current position

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| September 2019 — | Associate professor (доцент), <i>Department of Mathematics and Computer Science</i> , Saint Petersburg University, Russia  |
| September 2017 — | (partially affiliated) Senior Researcher (старший научный сотрудник) in the <i>International Laboratory of Game Theory and Decision Making</i> , Saint Petersburg branch of HSE (National Research University Higher School of Economics), Russia. |

## Education

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| 2015 | PhD in Mathematics, University of Geneva<br>Thesis topic: “Tropical geometry for Nagata’s conjecture and Legendrian curves”<br>Advisor: Grigory Mikhalkin  |
| 2010 | Specialist (=master) in Mathematics, Saint Petersburg University, Russia<br>Thesis topic: “The Alexander polynomial as an intersection of two cycles in a symmetric power”<br>Advisor: Oleg Viro |
| 2005 | Lyceum 239, Saint Petersburg. From 6th to 11th year in school I was in a mathematical circle (the teacher: A.S. Golovanov)   |

## Positions

July 2016 – August 2017, A holder of a Switzerland grant PostDoc.Mobility, obtained to accomplish two research projects (non-commutative toric geometry and power laws in sandpiles) in CINVESTAV (Centro de Investigación y de Estudios Avanzados), Mexico City. Hosting professor is Ernesto Lupercio.

## Honors, Awards, and Grants

2020	Russian Science Foundation grant №20-71-00007, Scaling in sandpile models, 2020-2022
2017	Young Russian Mathematics grant holder, 2018 – 2020
2016	PostDoc.Mobility Switzerland grant, 1.07.2016 – 31.08.2017
2014	Travel grant of UniGe for LERU Summer school “Sharing Excellence - The Value of Knowledge Exchange” in Oxford
2005	Gold medal at the International Mathematic Olympiad

## Consulting

2019	Consulting participants in Russian quota auctions (crab)
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## Industrial Experience

2016	Parallel computations on supercomputer Xiuhcoatl, CINVESTAV
2008-2011	Programmer and mathematician, modelling in biology, GGA Software Consulting programmers about statistics and biology

## Teaching Experience

*Symplectic topology, Introduction to homotopy theory, Game theory, Introduction to homology theory, General topology*, SPbU, St. Petersburg

*Algebra and analysis* (for sociologists), *Game theory* (for economists), *Topological data analysis* (for programmers) HSE, St. Petersburg

*Courses on sandpiles and tropical geometry*, CINVESTAV, Mexico City, Chebyshev Laboratory, St. Petersburg, Contemporary mathematics school for students, Dubna

*Analyses 1, Complex Analysis* (assistant; in French), *Characteristic classes* (assistant; in English), *Méthodes élémentaires* (for the program Athena: about forty school students joined the course for 3rd year university students), University of Geneva

*Differential topology, Introduction to tropical geometry* (PhysMathClub, PDMI), St. Petersburg

*Tutor of a math circle* (2005-2011, High school 239), St. Petersburg

## Service

2020	Editor of a book about St. Petersburg mathematicians
2020	Organiser of a program for talented students in Sirius

## Papers

### Mathematics

- 2020 Sandpile Solitons via Smoothing of Superharmonic Functions, *Communications in Mathematical Physics*, 378(3), 1649-1675 (joint with M. Shkolnikov)
- 2019 Tropical formulae for summation over a part of  $SL(2, \mathbb{Z})$ , *European Journal of Mathematics*, Volume 5, Issue 3, 909-928 (joint with M. Shkolnikov)
- 2018 Legendrian curves in  $\mathbb{C}P^3$ : cubics and curves on a quadratic surface, *Zapiski Nauchnyh Seminarov PDMI*, vol. 476 (2018), Geometry and Topology Series 13, 92-110
- 2018 Introduction to tropical series and wave dynamic on them, *Discrete and continuous dynamical systems, A*, 2018, 38(6): 2843-2865 (joint with M. Shkolnikov)
- 2017 The number  $\pi$  and summation by  $SL(2, \mathbb{Z})$ , *Arnold Mathematical Journal*, Volume 3, Issue 4, 511-517 (joint with M. Shkolnikov)
- 2017 Tropical approach to Nagata's conjecture in positive characteristic, *Discrete and Computational Geometry*, 58(1), 158-179
- 2016 Sandpiles on the heptagonal tiling, *Knot Theory and Its Ramifications*, Vol. 26, Issue 12, 1642005 (joint with M. Shkolnikov)
- 2016 Tropical curves in sandpiles, *Comptes Rendus Mathématique*, Volume 354, Issue 2, 1 February 2016, 125-130 (joint with M. Shkolnikov)
- 2016 The Newton polygon of a planar singular curve and its subdivision, *Journal of Combinatorial Theory, Series A*, 137, 226 - 256
- 2015 The Alexander polynomial as an intersection of two cycles in a symmetric power, *Journal of Knot Theory and Its Ramifications*, Vol. 24, No. 12, 1550061

### Miscellanea

- 2020 Как учить социологов математике, *Математическое просвещение*. Третья серия, вып. 25, 143-154
- 2019 О Санкт-Петербургской заочной олимпиаде по топологии, *Математическое просвещение*. Третья серия, вып. 24, 151-158
- 2018 Self-Organized Criticality and Pattern Emergence through the Lens of Tropical Geometry, *PNAS* August 28, 2018. 115 (35) E8135-E8142 (joint with A. Guzmán-Sáenz, Y. Prieto, M. Shkolnikov, V. Kalinina, E. Lupercio)