

# Vladimir Sosnilo

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## Research interests

- Category theory and  $\infty$ -category theory, homotopy type theory.
- Algebraic K-theory, stable  $\infty$ -categories, noncommutative motives.
- Classical and derived algebraic geometry, motivic homotopy theory, descent conditions for cohomology theories.

## Employment

- 2018- **Laboratory of Modern Algebra and Applications**, St. Petersburg, Russia.  
Research Engineer
- 2013-2018 **Chebyshev Laboratory**, St. Petersburg, Russia.  
Research Engineer
- 2011-2012 **LoyaltyPlant company**, St. Petersburg, Russia.  
Software Developer

## Education

- 2018- **Phd in Mathematics**, St. Petersburg Department of Steklov Institute, St. Petersburg, Russia.  
Advisor: Ivan Panin
- 2016-2017 **Master of Mathematics**, University of Duisburg-Essen, Essen, Germany.  
Advisor: Marc Levine
- 2011-2015 **Bachelor of Mathematics**, St. Petersburg State University, St. Petersburg, Russia.  
Advisor: Mikhail Bondarko

## Publications

- 2021 Elden Elmanto, Marc Hoyois, Adeel A. Khan, Vladimir Sosnilo, Maria Yakerson. Motivic infinite loop spaces. *Accepted to Cambridge Journal of Mathematics*. arXiv:1711.05248
- Elden Elmanto, Vladimir Sosnilo. On nilpotent extensions of  $\infty$ -categories and the cyclotomic trace. *Accepted to International Mathematics Research Notices*. arXiv:2010.09155
- Tom Bachmann, Elden Elmanto, Marc Hoyois, Adeel A. Khan, Vladimir Sosnilo, Maria Yakerson. On the infinite loop spaces of algebraic cobordism and the motivic sphere. *Épjournal de Géométrie Algébrique*, 5, published online. arXiv:1911.02262
- Mikhail Bondarko, Vladimir Sosnilo. On Chow-weight homology of geometric motives. *Accepted to Transactions of the AMS*. arXiv:1411.6354
- Vladimir Sosnilo. Regularity of spectral stacks and discreteness of weight-hearts. *Quarterly Journal of Mathematics*, published online. arXiv:1901.02431

- 2020 Elden Elmanto, Marc Hoyois, Adeel A. Khan, Vladimir Sosnilo, Maria Yakerson. Modules over algebraic cobordism. *Forum of Mathematics, Pi*, 8, published online. arXiv:1908.02162
- Elden Elmanto, Marc Hoyois, Adeel A. Khan, Vladimir Sosnilo, Maria Yakerson. Framed transfers and motivic fundamental classes. *Journal of Topology*, 13(2):460–500. arXiv:1809.10666
- 2019 Vladimir Sosnilo. Theorem of the heart in negative K-theory for weight structures. *Documenta Mathematica*, 24, 2137–2158. arXiv:1705.07995
- Mikhail Bondarko, Vladimir Sosnilo. On purely generated  $\alpha$ -smashing weight structures and weight-exact localizations. *Journal of Algebra*, 535, 407–455. arXiv:1712.00850
- Sergei O. Ivanov, Roman Mikhailov, Vladimir Sosnilo. Higher colimits, derived functors and homology. *Sbornik Mathematics*, 210(9), 1222–1258. arXiv:1805.07754
- 2018 Mikhail Bondarko, Vladimir Sosnilo. On the weight lifting property for localizations of triangulated categories. *Lobachevskii Journal of Mathematics*, 39, 970–984. arXiv:1510.03403
- Mikhail Bondarko, Vladimir Sosnilo. On constructing weight structures and extending them to idempotent extensions. *Homology, Homotopy and Applications*, 20(1), pp.37–57. arXiv:1605.08372
- 2016 Mikhail Bondarko, Vladimir Sosnilo. Non-commutative localizations of additive categories and weight structures; applications to birational motives. *Journal of the Institute of Mathematics of Jussieu*, 17(4), 785–821. arXiv:1304.6059
- 2015 Mikhail Bondarko, Vladimir Sosnilo. A Nullstellensatz for triangulated categories. *Algebra and Analysis*, 27(6), 41–56. arXiv:1508.04427

### Preprints

Tom Bachmann, Adeel A. Khan, Charanya Ravi, Vladimir Sosnilo. Categorical Milnor squares and K-theory of algebraic stacks. arXiv:2011.04355

### Invited Talks

- Jan, 2021 **On nilpotent extensions of  $\infty$ -categories and the cyclotomic trace.**  
AG seminar, Regensburg University, online
- Oct, 2020 **Comparing Nisnevich descent, Milnor excision, and the pro-cdh excision.**  
AG seminar, St. Petersburg State University, online
- Sep, 2020 **Excision for algebraic K-theory with respect to categorical Milnor squares.**  
Seminar on A1-topology, motives and K-theory, St. Petersburg State University, online
- Jun, 2020 **Pro-excision for stacks, [link](#).**  
Conference “Motives and What Not”, online
- Dec, 2019 **Milnor squares and Weibel’s conjecture.**  
Seminar on A1-topology, motives and K-theory, St. Petersburg State University
- Nov, 2019 **Regularity of spectral stacks, their algebraic K-theory, and weight structures, [link](#).**  
AG seminar, Regensburg University
- May, 2018 **K-theory of the category of Voevodsky motives.**  
St. Petersburg algebraic geometry symposium for young mathematicians, St. Petersburg State University
- Dec, 2018 **Weight structures on stable infinity-categories.**  
Algebra/Topology seminar, University of Copenhagen

- Nov, 2017 **Comparing different framed transfers.**  
Seminar on A1-topology, motives and K-theory, St. Petersburg State University
- Jun, 2017 **Theorem of the heart for weight structures.**  
AG seminar, Regensburg University
- Sep, 2016 **Non-commutative localizations of additive categories and weight structures.**  
Harish-Chandra Research Institute
- Apr, 2015 **Noncommutative localizations of additive categories and weight structures.**  
Faddeev seminar, St. Petersburg Department of Steklov Institute

## Awards

- 2013, 2017 **Rokhlin grant**, awarded by St. Petersburg Department of Steklov Institute.

## Teaching experience

- Winter, 2021 **Sheaves and the continuum hypothesis**, short course for the Winter School in Mathematics and Theoretical Computer Science, [link](#).  
online
- Fall, 2015 **Algebraic topology and vector bundles**, joint with Alexey Ananyevskiy, course for sophomore students.  
St. Petersburg State University
- Fall, 2014 **Linear algebra**, problem sessions for sophomore students.  
St. Petersburg State University
- Fall, 2013 **Introduction to commutative algebra**, course for high school students.  
Laboratory of Continuous Mathematical Education

## Supervising students

- 2015-2016 A high school student of the "Laboratory of Continuous Mathematical Education", Gleb Novikov, completed a research project under my supervision and presented it at the International Science and Engineering Fair in Pittsburgh, Pennsylvania, USA

## Organizing seminars

- Fall, 2020 **Homotopy type theory**, joint with Valery Isaev, [recordings](#) (in Russian).  
online
- Spring, 2020 **Higher category theory**.  
online
- Fall, 2019 **Type theory**, joint with Dmitry Shtukenberg.  
St. Petersburg State University

## Refereeing for mathematical journals

Algebraic & Geometric Topology

## Languages

- English: fluent  
Japanese: intermediate  
Russian: native