Vladimir Sosnilo

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Research interests

- Category theory and ∞-category theory, homotopy type theory.
- Algebraic K-theory, stable ∞-categories, noncommutative motives.
- 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**, *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 ∞-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. *Épijournal 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 α-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 ∞-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

Apr, 2015 **Noncommutative localizations of additive categories and weight structures**.
Faddeev seminar, Petersburg Department of Steklov Institute

Awards

2013, 2017 **Rokhlin grant**, *awarded by 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