

INNA ZAKHAREVICH  
CURRICULUM VITAE

**Contact Information**

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**Fields of Interest**

Algebraic topology, algebraic  $K$ -theory, scissors congruence, motivic integration

**Employment**

2016-present	Assistant Professor, LCP Ho Sesquicentennial Faculty Fellowship, Department of Mathematics, Cornell University, Ithaca, NY
2012-2016	L. E. Dickson Instructor, Department of Mathematics, University of Chicago, Chicago, IL
2013-2014	Member, Institute of Advanced Study, Princeton, NJ

**Education**

2008-2012	<b>Massachusetts Institute of Technology</b> Cambridge, MA Ph.D. in Mathematics, Dissertation: “Scissors congruence as $K$ -theory” Advisor: Michael Hopkins
2006-2007	<b>Cambridge University</b> Cambridge, England, United Kingdom CASM (‘part III’ mathematics) with distinction
2002-2006	<b>Harvard University</b> Cambridge, MA AB, Magna cum laude in Mathematics

**Awards, Grants and Scholarships**

2021	GPSA Faculty Teaching, Advising, and Mentorship Award
2021-2024	Co-PI on NSF FRG grant DMS-2052977: “Trace Methods and Applications for Cut-and-Paste $K$ -Theory”
2019-2024	PI on NSF CAREER Grant DMS-1846767: “On Constructing $K$ -Theoretic Invariants for Geometric Objects”; \$448,306.
2020	Cornell University Department of Mathematics Junior Faculty Teaching Award
2018-2021	Co-PI on NSF grant DMS-1806254: “The Cornell Topology Conference”; \$72,000.
2016-2019	PI on NSF grant DMS-1654522: “Generalized Scissors Congruence”; \$176,794
2016-2017	LCP Ho Sesquicentennial Faculty Fellowship

2012-2016	NSF Mathematical Sciences Postdoctoral Research Program fellowship
2008-2011	NSF Graduate Student Fellowship
2006-2007	Gates Cambridge Fellow
2006	Elected to Phi Beta Kappa

### Papers, preprints and documents in preparation

- (1) Zakharevich, Inna. “A Generalization of Wigner’s law.” *Comm. Math. Phys.*, vol 268, (2006), no. 2, pp. 403-414.
- (2) Zakharevich, Inna. “Scissors Congruence as  $K$ -theory.” *Homology, Homotopy and Applications*, vol 14, (2012) 1, pp. 181-202.
- (3) Zakharevich, Inna. “Simplicial Polytope Complexes and Deloopings of  $K$ -theory.” *Homology, Homotopy and Applications*, vol 15, (2013) 2 pp. 301-330.
- (4) Droz, Jean-Marie and Zakharevich-Inna. “Model categories with simple homotopy categories.” *Theory Appl. Categ.*, vol 30 (2015). pp15-39.
- (5) Bobkova, Irina, Lindenstrauss, Ayelet, Poirier, Kate, Richter, Birgit and Zakharevich, Inna. “On the higher topological Hochschild homology of  $\mathbf{F}_p$  and commutative  $\mathbf{F}_p$ -group algebras.” *Women in Topology: Collaborations in Homotopy Theory, Contemporary Mathematics*, vol 641 (2015), p97-122.
- (6) Zakharevich, Inna. “The category of Waldhausen categories as a closed multicategory.” *New directions in homotopy theory, Contemporary Mathematics* vol 707, (2018) 175-194.
- (7) Droz, Jean-Marie and Zakharevich, Inna. “Extending to a model category is not a first-order property.” *New York J. Math.*, vol 27 (2021) 319-348.
- (8) Weibel, Charles and Zakharevich, Inna. “Principal ideals in mod- $\ell$  Milnor  $K$ -theory.” arXiv: 1507.03035. *J. Homotopy Relat. Struct.*, col 12 (2017), 4 pp. 1033-1049.
- (9) Zakharevich, Inna. “The  $K$ -theory of assemblers.” *Advances in Mathematics*, vol 304 (2017). pp 1176-1218.
- (10) Zakharevich, Inna. “The annihilator of the Lefschetz motive.” *Duke Math. J.*, Vol 166 (11), p1989-2022.
- (11) Zakharevich Inna. “On  $K_1$  of an assembler.” *J. Pure Appl. Algebra* 221 (2017), no. 7, 1867-1898.
- (12) May, J. Peter, Stephan, Marc and Zakharevich, Inna. “The homotopy theory of equivariant posets.” *Cah. Topol. Géom. Différ Catég.* 58 (2017), 2 pp. 82-114.
- (13) Halliwell, Gemma, Höning, Eva, Lindenstrauss, Ayelet, Richter, Birgit and Zakharevich, Inna. “Relative Loday constructions and applications to higher  $THH$  calculations.” *Women in Topology II: Further collaborations in homotopy theory, Topology and its Applications*, vol 235 pp. 523-545 (2018).
- (14) Bobkova, Irina, Höning, Eva, Lindenstrauss, Ayelet, Poirier, Kate, Richter, Birgit and Zakharevich, Inna. “Splittings and calculational techniques for higher  $THH$ .” *Algebr. Geom. Topol.* 19 (2019), no. 7, 3711-3753.
- (15) Zakharevich, Inna. “Perspectives on scissors congruence.” *Bull. Amer. Math. Soc.* 53 (2016), vol 2, p269-294.
- (16) Campbell, Jonathan, Wolfson, Jesse and Zakharevich, Inna. “Derived  $\ell$ -adic zeta functions.” *Adv. Math.* 354 (2019), 106760, 53 pp.
- (17) Campbell, Jonathan and Zakharevich, Inna. “Devissage and Localization for the Grothendieck Spectrum of Varieties.” arXiv: 1811.08014 *To appear in Adv. in Math.*
- (18) Zakharevich, Inna. “Attitudes of  $K$ -theory: Topological, algebraic, combinatorial.” *Notices Amer. Math. Soc.* 66 (2019), no. 7, 1034-1044.
- (19) Campbell, Jonathan and Zakharevich, Inna. “Hilbert’s third problem and a conjecture of Goncharov.” arXiv: 1910.07112.
- (20) Arcila Maya, Niny, Bethea, Candace, Opie, Morgan, Wickelgren, Kirsten and Zakharevich, Inna. “The compactly supported  $\mathbb{A}^1$ -Euler characteristic and the Hochschild complex.” arXiv: 2003.09457.

- (21) Campbell, Jonathan A., Lind, John A., Malkiewich, Cary, Ponto, Kate, and Zakharevich, Inna. “ $K$ -theory of endomorphisms, the  $TR$ -trace, and zeta functions.” arXiv: 2005.04334.
- (22) Campbell, Jonathan A., Lind, John A., Malkiewich, Cary, Ponto, Kate, and Zakharevich, Inna. “Spectral Waldhausen categories, the  $S_\bullet$ -construction, and the Dennis trace.” arXiv: 2006.04006.
- (23) Zakharevich, Inna. “ $E_\infty$ -Ring structures on the  $K$ -theory of assemblers and point counting.” *In preparation*.

## Teaching Experience

Spring 2021	Math 6510: Algebraic topology
Fall 2020	Math 6530: $K$ -theory and Characteristic Classes
Fall 2017	
Fall 2020	Math 1300: Mathematical explorations
Fall 2019	
Fall 2019	Math 7510: Bernstein seminar: Algebraic $K$ -theory
Spring 2019	Math 3340: Higher algebra
Fall 2018	Math 6540: Homotopy theory
Spring 2018	Math 6510: Algebraic topology
Fall 2017	Math 2220: Multivariable calculus
Fall 2016	Math 3320: Introduction to Number Theory
Spring 2016	Math 263: Undergraduate Algebraic Topology
Winter 2016	Math 262: Point-Set Topology
Summer 2015	Co-teacher for algebraic topology section of Summer REU program
Summer 2013	
Winter 2015	Math 258: Honors Basic Algebra I-II
Spring 2013	Analysis in $\mathbf{R}^n$ (two sections)
Spring 2010	Teaching assistant: 18.06: Linear Algebra
Spring 2009	
Summer 2007	18.06: Linear Algebra
Summer 2008	
Fall 2009	Teaching assistant: 18.023: Multivariable Calculus with Applications (two sections)
2007-2012	Class leader in the Boston Math Circle <i>An after-school mathematics enrichment program for area children; I taught ages 8-12</i>
2008-2010	Resident tutor at Cabot House, Harvard University <i>A job combining the duties of a tutor and resident advisor with the duties of an academic advisor for a small number of students.</i>

Summer 2010	Teacher at the IDEA Math Program
Winter 2010	<i>IDEA Math is an enrichment program for middle- and high-school students preparing to participate in olympiads.</i>
Summer 2011	
Winter 2014	
Summer 2010	Coach, US Delegation to the China Girls' Math Olympiad
Summer 2011	
Summer 2012	Coach, US Delegation to the European Girls' Math Olympiad

### Other Activities

2018-present	Founder and teacher of Ithaca Area K-2 math circle; expanded to two classes in Fall 2020
2017-present	Co-organizer for Cornell Topology Festival
2017-present	Co-teacher for DeWitt math club
2020-2023	Organizer for Women in Topology IV (scheduled August 2023)
2021	Visiting teacher at the Math Olympiad Summer Program
2020	Grader for USOMO and CMC, and Putnam competitions
2020	Working on Active Learning Initiative to create material resources for 1300 (Mathematical Explorations)
2019-2020	Co-organizer for special session "Homotopical methods in geometry", AMS southeastern sectional meeting spring 2020 (cancelled due to COVID-19).
2019	Scientific committee for summer school on fixed point theory and trace methods, summer 2020. (Cancelled due to COVID-19)
2018	Participant in IAS Summer Collaborators Program
2018	Scientific committee member for workshop on algebraic $K$ -theory, satellite to ICM, Buenos Aires, Argentina.
2017	Co-organizer for first Northeast Topology Day
2017	Co-organizer for special session on algebraic topology at Fall 2017 AMS sectional meeting
2016	Organized and taught after-school mathematics enrichment activity "To infinity and beyond" at Cayuga Heights Elementary School
2016	Co-organizer of and speaker in UChicago summer school in algebraic topology
2016	Co-organized and taught at algebraic topology summer school at University of Chicago
2014-2016	Co-organized algebraic topology seminar at University of Chicago
2015	Co-organized Midwest Topology Seminar conference
2014	Organized motivic integration reading group at University of Chicago, fall 2014.
2014	Organized and spoke in Goncharov reading group seminar at the IAS.
2011	Redesigned University of Chicago Algebraic Topology Seminar webpage.
2011	Redesigned MIT Topology Seminar webpage.

### Conference talks

- 2009 “Topological Modular Forms”, Workshop on Arithmetic Geometry in Kanazawa, Kanazawa, Japan.
- 2010 “Higher Scissors Congruence”, Young Topologists Meeting, Copenhagen, Denmark.
- 2011 “Scissors Congruence as  $K$ -Theory”, AMS Central Meeting Special Session on Algebraic  $K$ -Theory and Homotopy Theory, Iowa City, IA.
- 2011 “A Symmetric Monoidal Structure on Scissors Congruence Spectra”, Young Topologists Meeting, Lausanne, Switzerland.
- 2011 “Scissors Congruence as  $K$ -Theory”, Workshop on Algebraic Topology and Combinatorics, Buenos Aires, Argentina.
- 2012 “ $K$ -theory as a multifunctor”, Young Topologists Meeting, Copenhagen, Denmark.
- 2012 “Ring structures on scissors congruence spectra”, Midwest Topology Seminar, East Lansing, MI.
- 2013 “Scissors congruence and  $K$ -theory”, Midwest WIMS, Chicago IL.
- 2013 “On the Grothendieck spectrum of varieties”, Motives in Tokyo, Tokyo, Japan.
- 2013 “The  $K$ -theory of assemblers,” Homotopical Methods in Algebraic Geometry, Los Angeles, CA.
- 2014 “A spectral sequence for the Grothendieck spectrum of varieties”, Manifolds,  $K$ -theory and related topics, Dubrovnic, Croatia.
- 2014 “Algebraic  $K$ -theory of varieties and birational geometry,” Workshop on differential cohomologies and algebraic  $K$ -theory, CUNY, New York, NY.
- 2015 “An investigation of small model categories,” AWM Meeting in conjunction with JMM, San Antonio, TX.
- 2015 “The annihilator of the Lefschetz motive,”  $K$ -theory, cyclic homology and motives, New Brunswick, NJ.
- 2016 “Deriving the Grothendieck ring of varieties,” Joint mathematics meetings: Special session on algebraic geometry, Seattle, WA.
- 2016 “A topological proof of a theorem of Larsen and Lunts”, Midwest Topology Seminar, Evanston, IL.
- 2016 “Deriving Zeta functions”, Mid-Atlantic Topology Conference, Baltimore, MA.
- 2016 “Analyzing geometric invariants with  $K$ -theory”, Conference on Combinatorial structures in Geometry, Osnabrück, Germany.
- 2017 “An example of a derived motivic measure”, Texas Symposium on Algebraic Geometry, Houston, TX.
- 2017 “Constructing derived zeta functions”, Conference in honor of Paul Goerss, Urbana-Champaign, IL
- 2017 “A derived zeta function”, Special session on  $K$ -theory and motives at the Mathematical Congress of the Americas, Montreal, Canada.
- 2018 “Constructing derived motivic measures”, Homotopy theory summer: Equivariant homotopy theory and  $K$ -theory, Berlin, Germany.
- 2018 “Combinatorial aspects of  $K$ -theory”, mini-course at summer school attached to algebraic  $K$ -theory satellite session at 2018 ICM, La Plata, Argentina.

2018	“Algebraic $K$ -theory, combinatorial $K$ -theory and geometry.” Memorial conference for Vladimir Voevodsky, Princeton, NJ.
2018	“Replacing algebra with geometry”, Second Northeast Topology Seminar, Albany, NY.
2019	“Decompositions of varieties, birationality, and $K$ -theory”, MSRI connections for women, Berkeley, CA.
2019	“Quillen’s Dévissage in geometry”, Shanks workshop on homotopy, Nashville, TN.
2019	“Quillen’s Dévissage in Geometry”, Arithmetic topology—interactions between topology, number theory, and algebraic geometry, Vancouver, BC, Canada.
2019	“The Dehn complex: scissors congruence, $K$ -theory, and regulators”, Mayday 2019, Chicago, IL.
2019	“The Dehn complex: scissors congruence, $K$ -theory, and regulators”, NRW Topology Conference, Dusseldorf, Germany.
2020 CANCELLED (COVID)	TBA, GSTGC 2020, Bloomington, IN.
2020 CANCELLED (COVID)	TBA, Mid-Atlantic topology conference, Philadelphia, PA.
2020 CANCELLED (COVID)	Mini-course on scissors congruence, Scissors congruence: then and now, Copenhagen, Denmark.
2020 CANCELLED (COVID)	Higher categories and geometry, Regensburg, Germany.
2021 ONLINE (COVID)	“Detecting nontrivial elements in $K_1(\mathbf{Var})$ with point counting”, GSTGC 2020, University of Indiana, Bloomington, IN.
2021 ONLINE (COVID)	“Algebraic $K$ -theory: addition, subtraction, and the art of making no choices”, Algebraic Topology for Amateurs, Universität Marburg, Germany.
2022 UPCOMING	TBA, Alexander Goncharov Birthday Conference, New Haven, CT.

### Workshop Participation

2012	Talbot: Calculus of Functors.
2012	“Pseudoisotopies and $K_2$ ”, West Coast Algebraic Topology Summer School: Algebraic $K$ -theory, Stanford, CA.
2013	Women in Topology, Banff, Alberta, Canada.
2014	“Morse Field Theories”, West Coast Algebraic Topology Summer School: TQFTs, Pacific Institute for the Mathematical Sciences, Alberta, Canada.
2015-2018	AIM SQuaRE together with Irina Bobkova, Ayelet Lindenstrass, Kate Poirier and Birgit Richter
2015	Visitor at the Hausdorff Institute’s equivariant theories trimester.
2016	Women in Topology II, Banff, Alberta, Canada.
2016	“Algebraic $K$ -theory and Motivic Cohomology”, Oberwolfach, Germany.
2017	Workshop on Homotopical Type Theory, Snowbird, UT.
2018	“Topological cyclic homology”, Oberwolfach, Germany.
2019	Problem session leader at the Arizona Winter School “Topology and Arithmetic”, Tucson, AZ.
2019	“Algebraic $K$ -theory”, Oberwolfach, Germany.

- 2019 Women in Topology III (group leader), Bonn, Germany.
- 2020 CANCELLED (COVID) Higher Segal Spaces and their Applications to Algebraic K-Theory, Hall Algebras, and Combinatorics, Oaxaca, Mexico.
- 2020 CANCELLED (COVID) Manifolds and K-theory: the legacy of Andrew Ranicki, Edinburgh, UK.
- 2020 ONLINE (COVID) “Algebraic Topology”, Oberwolfach, Germany.
- 2020 ONLINE (COVID) Derived, Birational, and Categorical Algebraic Geometry, Banff, Canada.
- 2022 UPCOMING “Algebraic  $K$ -theory”, Oberwolfach, Germany.

### Seminar talks

- 2011 “Scissors Congruence as  $K$ -Theory”, University of Oregon Geometry and Topology Seminar, Eugene, OR.
- 2011 “A  $K$ -Theoretic Construction of Scissors Congruence Spectra”, Northwestern University, Evanston, IL.
- 2011 “A  $K$ -Theoretic Construction of Scissors Congruence Spectra”, University of Chicago Topology Seminar, Chicago, IL.
- 2011 “A  $K$ -Theoretic Construction of Scissors Congruence Spectra”, University of Virginia Topology Seminar, Charlottesville, VA.
- 2011 “Scissors Congruence as  $K$ -Theory”, Stanford University Topology Seminar, Stanford, CA.
- 2012 “Scissors congruence as  $K$ -theory”, University of Western Ontario Topology Seminar, London, ON, Canada.
- 2012 “A  $K$ -theoretic perspective on scissors congruence problems”, John Hopkins University Topology Seminar, Baltimore, MD.
- 2012 “Ring structures on scissors congruence spectra”, University of Illinois at Urbana-Champaign Topology Seminar, Champaign, IL.
- 2013 “On filtrations of scissors congruence spectra”, Georgia Tech Algebra Seminar, Atlanta, GA.
- 2014 “Scissors congruence and algebraic  $K$ -theory”, Princeton University Algebraic Topology Seminar, Princeton, NJ.
- 2014 “Filtering the Grothendieck ring of varieties”, Institute for Advanced Study Members Seminar, Princeton, NJ.
- 2014 “Filtering the Grothendieck ring of varieties”, Harvard University Thursday Seminar, Cambridge, MA.
- 2014 “Filtering the Grothendieck ring of varieties”, Universitat Freiburg Topology Seminar, Freiburg, Germany.
- 2014 “Recognizing small model categories”, University of Illinois at Urbana-Champaign Topology Seminar, Urbana, IL.
- 2015 “Analyzing the Grothendieck ring of varieties using  $K$ -theory”, University of Illinois Chicago Topology Semina, Chicago, IL.
- 2015 “Analyzing the Grothendieck ring of varieties using  $K$ -theory”, Notre Dame University Topology Seminar, Notre Dame, IN.
- 2015 “On killing the affine line”, Brown University topology seminar, Providence, RI.

- 2015 “On killing the affine line”, Georgia Tech topology seminar, Atlanta, GA.
- 2015 “The annihilator of the Lefschetz motive”, Minnesota State University Algebraic Topology Seminar, Minneapolis, MN.
- 2015 “The annihilator of the Lefschetz motive”, University of Rochester Topology Seminar, Rochester, NY.
- 2015 “Connecting varieties, scissors congruence and  $K$ -theory”, Indiana University Algebra Seminar, Bloomington, IA.
- 2015 “Spectral sequences associated to the Grothendieck spectrum of varieties”, Indiana University Algebra Seminar, Bloomington, IA.
- 2015 “Cutting and pasting varieties using algebraic  $K$ -theory”, Columbia Algebraic Geometry Seminar, New York, NY.
- 2015 “Cutting and pasting using algebraic  $K$ -theory”, Cornell Topology and Geometric Group Theory Seminar, Ithaca, NY.
- 2016 “Cutting and pasting using algebraic  $K$ -theory”, University of Michigan Algebraic Geometry Seminar, Ann Arbor, MI.
- 2016 “The annihilator of the Lefschetz motive”, MIT algebraic topology seminar, Cambridge, MA.
- 2016 “From spaces to categories (and back!)”, Cornell Oliver Club, Ithaca, NY.
- 2016 “From spaces to categories (and back!)”, Syracuse University colloquium, Syracuse, NY.
- 2017 “An example of a derived motivic measure”, Princeton University algebraic geometry seminar, Princeton, NJ.
- 2017 “Deriving zeta functions”, UBC topology seminar, University of British Columbia, Vancouver, Canada.
- 2017 “Constructing derived motivic measures”, SUNY Stony Brook algebraic geometry seminar, Stony Brook, NY.
- 2017 “Measures, varieties, and higher structure”, Algebraic Topology Seminar, University of Rochester, Rochester, NY.
- 2018 “ $K$ -theory: addition, subtraction and the art of making no choices”, Stanford mathematics colloquium, Stanford, CA.
- 2018 “Deriving motivic measures”, University of Chicago Algebraic Topology Seminar, Chicago, IL.
- 2019 “Algebra with geometric objects”, University of Toronto mathematics colloquium, Toronto, Canada.
- 2019 “Translational scissors congruence”, Georgia Tech Topology Seminar, Atlanta, GA.
- 2019 “The Dehn complex: scissors congruence,  $K$ -theory, and regulators”, Stockholm University Topology Seminar, Stockholm, Sweden.
- 2019 Mini-course on CGW-categories, University of Wuppertal topology seminar, Wuppertal, Germany.
- 2020 ONLINE (COVID) “The Dehn complex: scissors congruence,  $K$ -theory, and regulators”, math department colloquium at Rutgers University, New Brunswick, NJ.
- 2020 ONLINE (COVID) “The Dehn complex: scissors congruence,  $K$ -theory, and regulators”, math department colloquium at Brown University, Providence, RI.



- 2020 ONLINE (COVID) “The Dehn complex: scissors congruence,  $K$ -theory, and regulators”, math department colloquium at University of Minnesota, Minneapolis, MN.
- 2020 ONLINE (COVID) “The Dehn complex: scissors congruence,  $K$ -theory, and regulators”, math department colloquium at Reed University, Portland, OR.
- 2020 ONLINE (COVID) “The Dehn complex: scissors congruence,  $K$ -theory, and regulators”, math department colloquium at Northwestern University, Evanston, IL.
- 2021 ONLINE (COVID) “The Dehn complex: scissors congruence,  $K$ -theory, and regulators”, UCLA topology seminar, Los Angeles, CA.
- 2021 ONLINE (COVID) “Detecting non-permutative elements of  $K_1(\mathbf{Var})$  using point counting”, Max Planck Institute of Mathematics Algebraic Geometry and Physics Seminar, Bonn, Germany.
- 2021 ONLINE (COVID) “Detecting non-permutative elements of  $K_1(\mathbf{Var})$  using point counting”, Muenster Topology Seminar, Muenster, Germany.
- 2021 “Detecting permutative elements of  $K_1(\mathbf{Var})$  using point counting”, Center for Communications Research, La Jolla, CA.
- 2021 UPCOMING TBA, Electronic Computational Homotopy Theory Seminar.