Alexander Perry

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Employment

Assistant Professor, University of Michigan, 2020–present.

Member, Institute for Advanced Study, 2019–2020.

NSF Postdoctoral Research Fellow, Columbia University, 2016–2019.

Education

Harvard University, Ph.D. in Mathematics, 2016.
Advisor: Joe Harris.

Columbia University, B.A. in Mathematics, summa cum laude, 2011.

Awards

NSF Conference Grant DMS-2448512 (PI), 2025.

NSF CAREER Grant DMS-2143271 (PI), 2022–2027.

NSF FRG Grant DMS-2052750 (PI), 2021–2024.

Sloan Research Fellowship, 2021.

NSF Grant DMS-1902060/DMS-2002709/DMS-2112747 (PI), 2019–2023.

NSF Postdoctoral Research Fellowship (PI), 2016–2020.

NSF Graduate Research Fellowship, 2011.

James Mills Peirce Fellowship, Harvard University, 2011.

Barry M. Goldwater Scholarship, 2009.

I.I. Rabi Scholarship, Columbia University, 2007.

Visiting Positions

Mathematical Institute of the University of Bonn, visitor, January 2017.

Mathematical Institute of the University of Bonn, visitor, November 2015.

Princeton University, Exchange Scholar, Fall 2014.

Princeton University, Exchange Scholar, Fall 2013.

Last updated: June 2025.

Publications and Preprints

The period-index conjecture for abelian threefolds and Donaldson–Thomas theory (with J. Hotchkiss).
Submitted. arXiv:2405.03315 (2024), 115 pages.

Stability conditions on crepant resolutions of quotients of product varieties (with S. Shah).
To appear in Algebr. Geom. arXiv:2404.09121 (2024), 19 pages.

Derived categories of quartic double fivefolds (with R. Cheng and X. Zhao).
Int. Math. Res. Not. IMRN (2025), no. 10.

Moduli spaces of stable objects in Enriques categories (with L. Pertusi and X. Zhao).
Submitted. arXiv:2305.10702 (2023), 52 pages.

The period-index problem and Hodge theory (with A.J. de Jong).
Preprint. arXiv:2212.12971 (2022), 35 pages.

Kuznetsov's Fano threefold conjecture via K3 categories and enhanced group actions (with A. Bayer).
J. Reine Angew. Math. 800 (2023), 107–153.

Serre functors and dimensions of residual categories (with A. Kuznetsov).
Submitted. arXiv:2109.02026 (2021), 53 pages.

The integral Hodge conjecture for two-dimensional Calabi–Yau categories.
Compos. Math. 158 (2022), no. 2, 287–333.

Stability conditions and moduli spaces for Kuznetsov components of Gushel–Mukai varieties (with L. Pertusi and X. Zhao).
Geom. Topol. 26 (2022), no. 7, 3055–3121.

Stability conditions in families (with A. Bayer, M. Lahoz, E. Macrì, H. Nuer, and P. Stellari).
Publ. Math. Inst. Hautes Études Sci., 133 (2021), 157–325.

Homological projective duality for quadrics (with A. Kuznetsov).
J. Algebraic Geom. 30 (2021), no. 3, 457–476.

Categorical cones and quadratic homological projective duality (with A. Kuznetsov).
Ann. Sci. Éc. Norm. Supér. (4) 56 (2023), no. 1, 1–57.

Categorical joins (with A. Kuznetsov).
J. Amer. Math. Soc. 34 (2021), no. 2, 505–564.

Noncommutative homological projective duality.
Adv. Math. 350 (2019), 877–972.

Hochschild cohomology and group actions.
Math. Z. 297 (2021), no. 3-4, 1273–1292.

Intersections of two Grassmannians in $\mathbf{P}^9$ (with L. Borisov and A. Căldăraru).
J. Reine Angew. Math. 760 (2020), 133–162.

Rationality does not specialize among terminal fourfolds.
Algebra Number Theory 11 (2017), no. 9, 2193–2196.

Derived categories of Gushel–Mukai varieties (with A. Kuznetsov).
Compos. Math. 154 (2018), no. 7, 1362–1406.

Rational points on twisted K3 surfaces and derived equivalences (with K. Ascher, K. Dasaratha, and R. Zhou).
Brauer Groups and Obstruction Problems, Progr. Math. 320 (2017), 13–28.

Derived categories of cyclic covers and their branch divisors (with A. Kuznetsov).
Selecta Math. (N.S.) 23 (2017), no. 1, 389–423.

Faithfully flat descent for projectivity of modules.
Preprint. arXiv:1011.0038 (2010), 22 pages.
Modified version also available at http://stacks.math.columbia.edu/tag/058B.

Resolving toric varieties with Nash blowups (with A. Atanasov, C. Lopez, N. Proudfoot, and M. Thaddeus).
Exp. Math. 20 (2011), no. 3, 288–303.

A conjecture of Evans on sums of Kloosterman sums (with E. Dummit and A. Goldberg).
Proc. Amer. Math. Soc. 138 (2010), no. 9, 3047–3056.

Other Writing

Keeping a problem list.
Notices of the AMS, Early Career Collection (2021).

Formal deformation theory.
Chapter for the Stacks Project (2011).
Modified version available at http://stacks.math.columbia.edu/tag/06G7.

Conference and Workshop Talks

Hyperkähler Varieties and Derived Categories, July 2025
Session of the Summer Research Institute in Algebraic Geometry,
Colorado State University

Stony Brook Lectures in Algebraic Geometry, October 2024
Stony Brook University

Western Algebraic Geometry Symposium (WAGS), November 2023
Washington University in St. Louis

Higher Dimensional Geometry, October 2023
Simons Foundation

Brauer Groups and Derived Categories, lecture series (3 talks), October 2023
Northwestern University

Fields Medal Symposium in Honor of Caucher Birkar, Fields Institute	October 2023
Stacks Project Workshop, University of Michigan	August 2023
Recent Trends in Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach	June 2023
Higher Dimensional Geometry, Simons Center for Geometry and Physics	May 2023
Algebraic Geometry Northeastern Series (AGNES), University of Massachusetts, Amherst	November 2022
Noncommutative Shapes, University of Antwerp	September 2022
Midwest Algebraic Geometry Graduate Conference, University of Illinois at Chicago	August 2022
Moduli spaces and stability conditions, Trento/Levico Terme, Italy (*cancelled for personal reasons*)	June 2022
School on Derived Categories of Fano Varieties, Hyperkähler Varieties and their Period Maps (gave lectures supplementing A. Kuznetsov's course), University of Udine	November 2021
September Algebraic Geometry School on K3 Categories and Hyperkähler Moduli Spaces, lecture series (5 talks) University of Warsaw	September 2021
Hyperkähler Geometry, lecture series (2 talks), Hausdorff Center for Mathematics	September 2021
Homological Mirror Symmetry and Applications, Institute of the Mathematical Sciences of the Americas, University of Miami (Online)	January 2021
Birational Geometry, Moscow (*cancelled due to COVID-19*)	October 2020
Hodge Theory and Rationality, Institute of the Mathematical Sciences of the Americas, University of Miami (*cancelled due to COVID-19*)	October 2020
Rationality Conference, Higher Dimensional Geometry in New York, Simons Foundation	July 2020
Families of Stability Conditions and Applications, Shanghai Center for Mathematical Sciences, Fudan University (*cancelled due to COVID-19*)	March 2020
School on Bridgeland Stability (2 talks), University of Warwick	December 2019

Workshop on Stability, Moduli Spaces and Applications, University of Illinois at Chicago	December 2019
Categorical and Analytic Invariants in Algebraic Geometry VII, Osaka University	November 2019
The Geometry of Derived Categories, University of Liverpool	September 2019
Workshop on Derived Categories, Moduli Spaces, and Deformation Theory, Cetraro	June 2019
Derived Categories and Related Topics, Sun Yat-sen University	May 2019
Algebraic Geometry Session of the Joint AMS-CMS Meeting, Fudan University	June 2018
Semiorthogonal Decompositions, Stability Conditions, and Sheaves of Categories, Institut de Mathématiques de Toulouse	May 2018
Algebraic Geometry Northeastern Series (AGNES), Rutgers University	April 2018
Stability Conditions and Homological Projective Duality, minicourse (3 talks), University of Michigan	April 2018
Moduli of Sheaves and Strange Duality, Penn State	December 2017
Algebraic Geometry: Birational Classification, Derived Categories, and Moduli Spaces, Mathematisches Forschungsinstitut Oberwolfach	September 2017
Advances in Birational Geometry: Future Directions, Erwin Schrödinger International Institute for Mathematical Physics	May 2017
Homological Mirror Symmetry: Methods and Structures, Institute for Advanced Study	November 2016
Classical Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach	June 2016
SYZ Mirror Symmetry and Related Topics, Harvard Center of Mathematical Sciences and Applications	May 2016
Graduate Student Conference on Algebra and Number Theory, Brown University	April 2016
Derived Algebraic Geometry Learning Workshop, expository talk, University of Michigan	May 2012
Supersymmetric Field Theories and Their Mathematical Implications, expository talk, Simons Center for Geometry and Physics	March 2012

Colloquium and Seminar Talks

Caltech, Number Theory Seminar	April 2024

University of California, Berkeley, Arithmetic Geometry and Number Theory Seminar	March 2024
MIT, Algebraic Geometry Seminar	December 2023
University of Michigan, Algebraic Geometry Seminar	September 2023
Princeton University, Algebraic Geometry Seminar	May 2023
University of Maryland, Algebra and Number Theory Seminar	April 2022
Michigan State University, Mathematics Colloquium	March 2022
University of California, Santa Barbara, Seminar on Geometry and Arithmetic	March 2022
University of Utah, Algebraic Geometry Seminar	December 2021
University of Georgia, Algebraic Geometry Seminar	September 2021
Zoom Algebraic Geometry Seminar	September 2021
Derived Seminar, online	June 2021
University of Massachusetts, Amherst, Mathematics Colloquium	May 2021
Leibniz Universität Hannover, Algebraic Geometry Seminar	May 2021
University of Warwick, Algebraic Geometry Seminar	December 2020
University of California, San Diego, Algebraic Geometry Seminar	November 2020
University of California, Berkeley, Number Theory Seminar	November 2020
Institut de Mathématiques de Jussieu — Paris Rive Gauche, Séminaire de Géométrie Algébrique	April 2020
Online Algebraic Geometry Seminar	April 2020
Rice University, Algebraic Geometry and Number Theory Seminar (*cancelled due to COVID-19*)	March 2020
Institute for Advanced Study, Mathematical Conversations Seminar	March 2020
Stanford University, Mathematics Colloquium	February 2020
Duke University, Mathematics Colloquium	January 2020
Northwestern University, Mathematics Colloquium	January 2020
Penn State University, Mathematics Colloquium	December 2019
University of Illinois at Chicago, Mathematics Colloquium	December 2019
Stony Brook University, Algebraic Geometry Seminar	October 2019
University of Pennsylvania, Math-Physics Joint Seminar	October 2019
University of Michigan, Mathematics Colloquium	October 2019
University of Michigan, Algebraic Geometry Seminar	October 2019

University of Illinois at Chicago, Algebraic Geometry Seminar	April 2019
Graduate Center, CUNY, Topology, Geometry, and Physics Seminar	April 2019
University of California, Davis, Algebraic Geometry Seminar	February 2019
Princeton University, Algebraic Geometry Seminar	November 2018
MIT, Algebraic Geometry Seminar	November 2018
University of Georgia, Algebraic Geometry Seminar	September 2018
University of California, San Diego, Algebraic Geometry Seminar	May 2018
Northwestern University, Algebraic Geometry Seminar	March 2018
University of Massachusetts Amherst, Valley Geometry Seminar	March 2018
University of Michigan, Algebraic Geometry Seminar	February 2018
Rutgers University–Newark, Mathematics Colloquium	January 2018
Cornell University, Algebraic Geometry Seminar	November 2017
University of Washington, Algebra and Algebraic Geometry Seminar	November 2017
Courant Institute of Mathematical Sciences, Algebraic Geometry Seminar	October 2017
Northeastern University, Geometry, Physics, and Representation Theory Seminar	September 2017
University of Pennsylvania, Math-Physics Joint Seminar	February 2017
University of Edinburgh, Geometry Seminar	January 2017
University of Edinburgh, Derived Categories Seminar	January 2017
Johns Hopkins University, Algebraic Geometry Seminar	December 2016
University of Michigan, Algebraic Geometry Seminar	November 2016
Columbia University, Algebraic Geometry Seminar	September 2016
Brown University, Algebraic Geometry Seminar	April 2016
Brandeis University, Mathematics Department Colloquium	February 2016
Boston College, Number Theory and Algebraic Geometry Seminar	February 2016
Higher School of Economics, Laboratory of Algebraic Geometry Seminar	December 2015
Steklov Mathematical Institute, Shafarevich Seminar	December 2015
Mathematical Institute of the University of Bonn, Algebraic Geometry Seminar (2 talks)	November 2015
Stony Brook University, Algebraic Geometry Seminar	November 2015
Stanford University, Algebraic Geometry Seminar	October 2015

Harvard University, S.-T. Yau's Student Seminar	October 2015
MIT, Algebraic Geometry Seminar	October 2015
Stanford University, Algebraic Geometry Seminar	May 2015
Institute for Advanced Study, Algebraic Geometry Seminar	April 2015
University of Michigan, Algebraic Geometry Seminar	February 2015
Rice University, Algebraic Geometry Seminar	October 2014
Steklov Mathematical Institute, Iskovskikh Seminar	November 2013

Other Invited Events

Algebraic Geometry: Wall Crossing and Moduli Spaces, Varieties and Derived Categories, Mathematisches Forschungsinstitut Oberwolfach	July 2024
Recent Trends in Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach	June 2023
Derived Categories, Arithmetic and Geometry, Mathematics Research Communities Conference, Mentor	June 2023
Algebraic Geometry: Moduli Spaces, Birational Geometry and Derived Aspects, Mathematisches Forschungsinstitut Oberwolfach	July 2022
Classical Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach	June 2021
Stacks Project Workshop (Online), Mentor	August 2020
Algebraic Geometry: Moduli spaces, Birational Geometry and Derived Aspects, Mathematisches Forschungsinstitut Oberwolfach	July 2020
Annual Meeting of the Simons Collaboration on Homological Mirror Symmetry, Simons Foundation	November 2019
Annual Meeting of the Simons Collaboration on Homological Mirror Symmetry, Simons Foundation	November 2018
Annual Meeting of the Simons Collaboration on Homological Mirror Symmetry, Simons Foundation	November 2017
Algebraic Geometry: Birational Classification, Derived Categories, and Moduli Spaces, Mathematisches Forschungsinstitut Oberwolfach	September 2017
Classical Algebraic Geometry, Mathematisches Forschungsinstitut Oberwolfach	June 2016

Conferences and Programs Co-organized

Hyperkähler Varieties and Derived Categories, Session of the Summer Research Institute in Algebraic Geometry, Colorado State University	July 2025

Graduate student and postdoc bootcamp for the Summer Research Institute in Algebraic Geometry, Colorado State University	July 2025
Michigan Algebraic Geometry Symposium, University of Michigan	April 2025
Hyperkähler Varieties, Derived Categories, and Moduli Spaces, Columbia University	February 2025
Noncommutative Algebraic Geometry, MSRI semester-long program	Spring 2024
Derived Categories and Moduli Spaces, University of California, Santa Barbara	May 2024
Michigan Algebraic Geometry Symposium, Michigan State University	November 2023
Derived Categories, Moduli Spaces, and Counting Invariants, Imperial College London	July 2023
Michigan Algebraic Geometry Symposium, University of Michigan	March 2023
Derived Categories, Moduli Spaces, and Hyperkähler Varieties, University of Michigan	August 2022
Derived Categories and Moduli Spaces, Cornell University	April 2022
Rationality Problems in Algebraic Geometry, American Institute of Mathematics (AIM)	July 2019

Seminars Co-organized

Michigan Arithmetic/Algebraic Geometry Learning Seminar	Winter 2021–present
Michigan Algebraic Geometry Seminar	Fall 2020–present
Michigan Algebraic Geometry Preprint Seminar	Fall 2020–present
Seminar on Donaldson–Thomas theory, Michigan	Winter 2022
Columbia Algebraic Geometry Seminar	Fall 2017–Spring 2019
Harvard Algebraic Geometry Learning Seminar:	
– Derived categories of coherent sheaves	Fall 2015
– Algebraic stacks	Spring 2014
– Hodge theory	Spring 2013
Harvard Baby Algebraic Geometry Seminar	Fall 2015

Departmental Service and Mentoring

Postdocs mentored:

– Younghan Bae, 2024–present.
– Shengxuan Liu, 2024–present.
– Yeqin Liu, 2024–present.
– Ben Gould, 2023–present.
– David Stapleton, 2021–2024.

Graduate students supervised:

– Ritwick Bhargava, 2024–present.
– Kenneth Ma, 2024–present.
– Riku Kurama, 2023–present.
– Saket Shah, 2022–present.
– James Hotchkiss, 2021–2023.

Michigan Graduate Admissions Committee, 2020–2022, 2024–2025.

Michigan Qualifying Review Exams Committee (Algebra), 2023–2024, Winter 2025.

Michigan Doctoral Committee, Fall 2023.

Michigan Executive Committee, 2022–2023.

Michigan Honors Committee, 2022–2023.

Michigan Library Committee, 2021–2022.

Ph.D. thesis committee member for:

– Qiusheng Zhao, Michigan, 2025.
– Sridhar Venkatesh, Michigan, 2025.
– Michael Mueller, Michigan, 2024.
– Andy Jiang, Michigan 2024.
– Karthik Ganapathy, Michigan 2024.
– Brad Dirks, Michigan 2023.
– James Hotchkiss, Michigan 2023.
– Attilio Castano, Michigan 2023.
– Shubhodip Mondal, Michigan 2022.
– Noah Olander, Columbia 2022.
– Haoyang Guo, Michigan 2021.
– Dmitrii Pirozhkov, Columbia 2020.
– Feiqi Jiang, Columbia 2018.

Ph.D. thesis reader for:

– Qiusheng Zhao, Michigan, 2025.

– Michael Mueller, Michigan, 2024.
– Andy Jiang, Michigan 2024.
– James Hotchkiss, Michigan 2023.
– Attilio Castano, Michigan 2023.
– Shubhodip Mondal, Michigan 2022.

Preliminary exam committee member for:
– Riku Kurama, Michigan 2023.
– Saket Shah, Michigan 2023.
– Gleb Terentiuk, Michigan 2022.
– Qiusheng Zhao, Michigan 2021.
– James Hotchkiss, Michigan 2021.
– Noah Olander, Columbia 2018.

Mentor for Mathematics Research Communities Conference on Derived Categories, Arithmetic and Geometry, 2023.
Supervised a research project for a group of 7 graduate students and postdocs.
Topic: Phantom categories.

Mentor for Stacks Project Workshop, 2023.
Supervised a project for a group of 5 graduate students.
Topic: Boundedness of semistable sheaves.

Mentor for Columbia Undergraduate Summer Research Program, 2018.
Co-supervised a research project for a group of 5 students.
Topic: Curves on surfaces over finite fields.

Supervised a Columbia undergraduate's study of algebraic geometry, 2016–2017.

Panelist for a grant writing panel, Michigan 2023.

Panelist for a panel on postdoc jobs, Michigan 2023.

Other Service

Reviewer for an Istituto Nazionale di Alta Matematica grant, 2024.

NSF grant panelist, 2020, 2023.

Reviewer for an ERC grant application, 2020.

Referee and quick opinions on papers for: Algebra & Number Theory, Algebraic Geometry, Advances in Geometry, Advances in Mathematics, Annali della Scuola Normale Superiore di Pisa, Annals of Mathematics, Annales Scientifiques de l'École Normale Supérieure, Bulletin of the London Mathematical Society, Communications in Algebra, Compositio Mathematica, Épijournal de Géométrie Algébrique, European Journal of Mathematics, EMS Surveys in Mathematical Sciences, Forum of Mathematics Sigma,

Geometry & Topology, International Mathematics Research Notices, Inventiones Mathematicae, Journal de Mathématiques Pures et Appliquées, Journal de l'École Polytechnique, Journal für die Reine und Angewandte Mathematik, Journal of Algebra, Journal of Algebraic Geometry, Journal of Pure and Applied Algebra, Journal of the American Mathematical Society, Journal of the European Mathematical Society, Journal of the London Mathematical Society, Kyoto Journal of Mathematics, Mathematische Zeitschrift, Michigan Mathematical Journal, Selecta Mathematica, Transactions of the American Mathematical Society.

Teaching

University of Michigan:

– Linear Algebra (Math 217), Winter 2025.
– Algebraic topology (Math 592), Winter 2023.
– Algebraic geometry I (Math 631), Fall 2021.
– Bridgeland stability (Math 732), Winter 2021.
– Introduction to algebra (Math 412), Fall 2020.

Columbia University:

– Algebraic curves, Fall 2018.
– Calculus I, Fall 2017.

Harvard University:

– Linear algebra, Spring 2016.
– Calculus II, Spring 2014.
– Morse theory tutorial, Spring 2013.

Columbia University, as a teaching assistant:

– Algebraic curves, Spring 2010 and Spring 2011.
– Representations of finite groups, Fall 2010.
– Introduction to modern analysis I, Fall 2009.
– Introduction to modern algebra II, Spring 2009.
– Introduction to modern algebra I, Fall 2008.