Jonathan Wise

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EDUCATION
- ◇ **Brown University**, Providence, RI.
  Ph.D. in Mathematics, May 2008
  Advisor: Dan Abramovich
  Thesis: *The genus zero Gromov–Witten invariants of* $[\mathrm{Sym}^2\mathbf{P}^2]$

- ◇ **Stanford University**, Stanford, CA.
  B.Sc. in Mathematics with departmental honors, June 2003
  Advisor: Daniel Bump
  Thesis: *Imaginary quadratic fields of class number one*

RESEARCH INTERESTS

logarithmic geometry, tropical geometry, deformation theory, sheaves, moduli of curves, stable maps, Gromov–Witten theory

PROFESSIONAL HISTORY
- ◇ Visiting Assistant Professor, Brown University, Fall 2019
- ◇ Assistant Professor, University of Colorado Boulder, August 2012 — present
- ◇ Postdoctoral fellow, Stanford University, April 2011 — June 2012
  Supervised by Ravi Vakil
- ◇ Postdoctoral fellow, University of British Columbia, August 2009 — March 2011
  Supervised by Jim Bryan
- ◇ Postdoctoral fellow, Stanford University, September 2008 — August 2009
  Supervised by Ravi Vakil

HONORS, AWARDS, AND FUNDING
- ◇ **Simons Collaboration Grant**, $42,000, 2019 – 2024
- ◇ **Simons Visiting Professor** at Cambridge University, Summer 2019
- ◇ **AIM SQuaRE**, 2016 – 2019, with Renzo Cavalieri, Melody Chan, and Martin Ulirsch
- ◇ **National Security Agency** Young Investigator's Grant, $40,000, 2016 — 2018
- ◇ **National Security Agency** Young Investigator's Grant, $40,000, 2014 — 2016
- ◇ **National Science Foundation** Mathematical Sciences Postdoctoral Research Fellowship, $108,000, 2008 — 2012
- ◇ **Brown University** Research Fellowship, 2004 — 2007
- ◇ **Firestone Award** for undergraduate thesis, June 2003

PUBLISHED PAPERS

"A moduli stack of tropical curves," with Renzo Cavalieri, Melody Chan, and Martin Ulirsch. Forum of Mathematics, Sigma, 8, E23.
doi:10.1017/fms.2020.16
arXiv:1704.03806

"Rational curves in the logarithmic multiplicative group," with Dhruv Ranganathan. Proc. Amer. Math. Soc. 148 (2020), 103–110.
doi:10.1090/proc/14749
arXiv:1901.08489

"Moduli of stable maps in genus 1 and logarithmic geometry I," with Dhruv Ranganathan and Keli Santos–Parker. Geometry & Topology 23 (2019), no. 7, 3315–3366.
doi:10.2140/gt.2019.23.3315
arXiv:1708.02359

"Moduli of stable maps in genus 1 and logarithmic geometry II," with Dhruv Ranganathan and Keli Santos–Parker. Algebra & Number Theory, 13 (2019), no. 8, 1765–1805.
doi:10.2140/ant.2019.13.1765
arXiv:1709.00490

"Uniqueness of minimal morphisms to logarithmic schemes." Algebraic Geometry, 6 (2019), no. 1, pp. 50–63.
doi:10.14231/AG-2019-003
arXiv:1601.02968

"An introduction to moduli stacks, with a view towards Higgs bundles on algebraic curves," with Sebastian Casalaina-Martin. The Geometry, Topology and Physics of Moduli Spaces of Higgs Bundles, pp. 199–399. National University of Singapore Institute for Mathematical Sciences Lectures Notes, vol. 36.
arXiv:1708.08124

"Birational invariance in logarithmic Gromov–Witten theory," with Dan Abramovich. Compositio Mathematica, 154 (2018), no. 3, pp. 595–620.
doi:10.1112/S0010437X17007667
arXiv:1306.1222

"Relative and orbifold Gromov–Witten invariants," with Dan Abramovich and Charles Cadman. Algebraic Geometry, 4 (2017), no. 4, pp. 472–500.
doi:10.14231/AG-2017-025
arXiv:1004.0981

"Boundedness of the space of stable logarithmic maps," with Dan Abramovich, Qile Chen, and Steffen Marcus. Journal of the European Mathematical Society, 19 (2017), no. 9, 2783–2809.
doi:10.4171/JEMS/728
arXiv:1408.0869

"A hyperelliptic Hodge integral." Portugalia Mathematicae, 73 (2016), no. 3, 207–218.
doi:10.4171/PM/1985
arXiv:0807.3964

"Skeletons and fans of logarithmic schemes," with Dan Abramovich, Qile Chen, Steffen Marcus, and Martin Ulirsch. *Nonarchimedean and Tropical Geometry*, 287–336, Simons Symposia, Springer, 2016.
doi:10.1007/978-3-319-30945-3_9
arXiv:1503.04343

"Moduli of morphisms to logarithmic schemes." Algebra & Number Theory 10 (2016), no. 4, 695–735.
doi:10.2140/ant.2016.10.695
arXiv:1408.0037

"The deformation theory of sheaves of commutative rings II." Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) 14 (2015), no. 2.
doi:10.2422/2036-2145.201111_008
arXiv:1102.2924

"Comparison theorems for Gromov–Witten invariants of smooth pairs and of degenerations," with Dan Abramovich and Steffen Marcus. Ann. Inst. Fourier (Grenoble) 64 (2014), no. 4, 1611–1667.

doi:10.5802/aif.2892
arXiv:1207.2085

"The moduli spaces of expanded degenerations and pairs," with Dan Abramovich, Charles Cadman, and Barbara Fantechi. Communications in Algebra 41 (2013), no. 6, 2346–2386.
doi:10.1080/00927872.2012.658589
arXiv:1110.2976

"Polynomial families of tautological classes on $\mathcal{M}_{g,n}^{\mathrm{rt}}$," with Renzo Cavalieri and Steffen Marcus. J. Pure Appl. Algebra 216 (2012), no. 4, 950–981.
doi:10.1016/j.jpaa.2011.10.037
arXiv:1107.0857

"The deformation theory of sheaves of commutative rings I." J. Algebra 352 (2012), 180–191.
doi:10.1016/j.jalgebra.2011.11.025
arXiv:1101.4069

"The genus zero Gromov–Witten invariants of the symmetric square of the plane." Communications in Anal. Geom. 19 (2011), no. 5, 923–974.
doi:CAG.2011.v19.n5.a5
arXiv:math/0702219

ACCEPTED PAPERS, TO APPEAR	"Logarithmic compactification of the Abel–Jacobi section," with Steffen Marcus. To appear in Proceedings of the London Mathematical Society. arXiv:1708.04471
SUBMITTED PAPERS	"The logarithmic Picard group and its tropicalization," with Samouil Molcho. arXiv:1807.11364 "The monodromy pairing for logarithmic 1-motifs" arXiv:1912.04253
PREPRINTS	"Obstruction theories and virtual fundamental classes." arXiv:1111.4200
ADVISING	Postdoc Samouil Molcho (2014–2015) Ph. D. student Keli Santos-Parker (graduated Spring 2017) Ph. D. student Paul Lessard (graduated Summer 2019) Ph. D. student John Willis (graduated Spring 2019) Ph. D. student Leo Herr (graduated Summer 2019) Ph. D. student Sebastian Bozlee (degree expected 2020) Ph. D. student Jonathan Quartin (degree expected 2023) Undergraduate thesis Dimitrios Economou (graduated Spring 2014) "On Galois theories" Undergraduate thesis Christian Klevdal (graduated Spring 2015) "A Galois correspondence with generalized covering spaces" Undergraduate Jenna Allen (degree expected 2021)
SERVICE TO THE PROFESSION	◇ **Organizer**, Western Algebraic Geometry Symposium, University of Colorado Boulder, Spring 2014. Co-organized with Sebastian Casalaina-Martin. ◇ **Organizer**, Special Session on Algebraic Geometry at the AMS Western Section Meeting, University of Colorado Boulder, April 13–14, 2013. Co-organized with Sebastian Casalaina–Martin, Renzo Cavalieri, and Brendan Hassett. ◇ **Organizer**, Front Range Algebraic Geometry and Number Theory seminar (FRAGMENT). Fall 2012 to present. Co-organized with Jeff Achter, Sebastian Casalaina–Martin, Renzo Cavalieri, and Rachel Priess.

⋄ **Organizer**, Special Session on Algebraic Geometry at the AMS Western Section Meeting, University of Hawai'i, March 3–4, 2012. Co-organized with Jim Bryan.

⋄ **Organizer**, Western Algebraic Geometry Symposium, Spring 2009. Co-organized with Aravind Asok and Martin Olsson.

⋄ **Organizer**, UBC Algebraic Geometry Seminar, Fall 2009 through Fall 2010. Co-organized with Zheng Hua.

⋄ **Referee**, Advances in Mathematics, Algebra and Number Theory, Algebraic Geometry, Geometry & Topology, International Mathematical Research Notices, Journal für die reine und angewandte Mathematik, Journal of Algebraic Geometry, Journal of the London Mathematical Society, Journal of Pure and Applied Algebra, Manuscripta Mathematica, Proceedings of the London Mathematical Society, Rocky Mountain Journal of Mathematics.

⋄ **Reviewer**, NSA Mathematical Sciences Grant Program.

SERVICE TO THE UNIVERSITY OF COLORADO

⋄ **Committee work** (Univeristy of Colorado Boulder), mathematics undergraduate committee (Fall 2013—Spring 2015, Fall 2017), diversity committee (Fall 2016—Spring 2017), computer committee (Fall 2016—Spring 2017)

⋄ **Math club** Faculty liason (Spring 2014—Fall 2015)

⋄ **Internal wiki and teaching archive** for the Math Department (Fall 2015—present)

⋄ **Putnam exam**, coach and faculty sponsor (Fall 2018)

LECTURE SERIES

Workshop on degenerate contributions to Gromov–Witten invariants
Imperial College, London, July 30 – August 3, 2018
"Logarithmic curves: moduli and enumerative geometry" (5 lectures)

Summer Workshop on Algebraic Geometry,
University of Georgia, Athens, GA, August 27–28, 2016
"Logarithmic structures and compactifications of moduli spaces" (2 lectures)

Summer School in Gromov–Witten Theory,
Pingree Park, Colorado, June 23 – July 4, 2014.
"The virtual fundamental class" (4 lectures)

INVITED CONFERENCE TALKS

Double Ramification Cycles and Integrable Systems, American Institute for Mathematics, October 7–11, 2019
"Logarithmic compactification of the double ramification locus"

Logarithmic Enumerative Geometry and Mirror Symmetry, Mathematisches Forschungsinstitut Oberwolfach, June 16–22, 2019
"Universal coefficients for logarithmic curves"

Tropical Varieties and Amoebas in Higher Dimension, Institut Mittag–Leffler, Stockholm, April 16–20, 2018
"Tropical data in algebraic moduli problems"

AMS Special Session on Algebraic and Combinatorial Aspects of Tropical Geometry, Columbus, OH, March 17–18, 2018
"Tropicalizing logarithmic schemes, particularly curves"

Equivariant geometry and algebraic stacks,
ANU Kioloa Campus, Australia, March 14–18, 2016
"Criteria for representability by monoids"

Moduli spaces of holomorphic differentials,
Humboldt–Universität zu Berlin / Eistein Stiftung, February 9–11, 2016
"Logarithmic rubber"

Workshop on Algebraic Stacks: Progress and Prospects,
Banff International Research Station, March 26, 2012.
"Deformation theory and Grothendieck topologies"

Western Algebraic Geometry Symposium,
Colorado State University, October 1–2, 2011.
"Relative Gromov–Witten theories"

Clay Institute workshop on Logarithmic Geometry and Moduli,
August 29 – September 1, 2011.
"Comparison of log. GW invariants"

MSRI semester on Algebraic Geometry,
May 14, 2009.
"Deformation theory (without the cotangent complex)"

Clay Institute EGA workshop, August 14, 2008.
"Chapter IV, Section 8: local finite presentation"

INVITED
SEMINAR TALKS

Brown University, Providence, November 1, 2019.
"Contracting genus 1 curves"

Harvard University, Cambridge, October 15, 2019.
"The universal compactified Jacobian and Grothendieck's theorem in tropical geometry"

Boston College, Boston, October 3, 2019.
"The logarithmic Picard group"

Imperial College, London, July 4, 2019.
"The logarithmic Picard group"

Goethe Universität, Frankfurt, June 26, 2019.
"The logarithmic Picard group"

Tropical Geometry, Amoebas, and Polytopes, Institut Mittag–Leffler, Stockholm, April 26,
2018
"The logarithmic Picard group and its tropicalization"

Yale University, June 21, 2017.
"What is a logarithmic moduli space?"

University of Michigan, December 12, 2016.
"Logarithmic compactifications of moduli spaces"

Massachusetts Institute of Technology, April 19, 2016.
"Compactifying the Abel map with logarithmic geometry"

University of British Columbia, November 9, 2015.
"Olsson fans"

University of Colorado, October 18, 2012.
"What is a commutative ring?"

Emory University, October 10, 2012.
"Infinitesimal deformation theory and Grothendieck topologies"

University of Colorado, January 27, 2012.
"Counting curves virtually"

Boston University, January 17, 2012.
"Comparing virtual curve counts"

University of Utah, December 6, 2011.
"Deformation theory and Grothendieck topologies"

University of Michigan, October 3, 2011.
"Relative Gromov–Witten theories"

California Institute of Technology, September 26, 2011.
"Relative Gromov–Witten theories"

Stanford University, March 4, 2011.
"The refined moduli space of stable maps"

University of British Columbia, January 24, 2011.
"Deformation theory"

University of Washington, October 26, 2010.
"A wacky stacky observation"

University of Toronto, March 26, 2010.
"The hidden smoothness of the space of stable maps"

Brown University, February 26, 2010.
"The hidden smoothness of the space of stable maps"

University of British Columbia, January 18, 2010.
"A smooth space of stable maps"

University of British Columbia, September 21, 2009.
"Deformation theory (without the cotangent complex)"

Ohio State University, March 3, 2009.
"Orbifold and relative Gromov–Witten invariants"

Stanford University, September 26, 2008.
"Orbifold and relative Gromov–Witten invariants"

University of British Columbia, January 28, 2008.
"Enumerative geometry of hyperelliptic curves in $\mathbf{CP}^2$"

University of Michigan, January 9, 2008.
"Enumerative geometry of hyperelliptic curves in $\mathbf{CP}^2$"

Institut für Mathematik, Universität Zürich, December 14, 2007.
"Enumerative geometry of hyperelliptic curves in $\mathbf{CP}^2$"

Brown University, October 29, 2007.
"Enumerative geometry of hyperelliptic curves in $\mathbf{CP}^2$"

Boston University, October 16, 2007.
"Enumerative geometry of hyperelliptic curves in $\mathbf{CP}^2$"

Princeton University, April 18, 2007.
"The crepant resolution conjecture for $[\mathrm{Sym}^2\mathbf{P}^2]$"

TALKS FOR UNDERGRADUATES

Yale University REU, June 20, 2017.
"What is a moduli space?"

Boise State University REU, July 26, 2013.
"What is a moduli space?"

Stanford University Mathematics Organization, May 18, 2011.
"What is a moduli space?"

Stanford University Mathematics Organization, October 29, 2008.
"Finding the roots of polynomials"

GRADUATE TEACHING	

University of Colorado, Boulder. Math 6170. Spring 2019. Algebraic Geometry.

University of Colorado, Boulder. Math 6150. Fall 2018. Commutative algebra.

University of Colorado, Boulder. Math 8174. Fall 2017. Topics in algebra: the universal coefficients theorem for algebraic curves.

University of Colorado, Boulder. Math 6170. Spring 2017. Algebraic geometry.

University of Colorado, Boulder. Math 6150. Fall 2016. Commutative algebra.

University of Colorado, Boulder. Math 6130. Fall 2015. Algebra 1.

University of Colorado, Boulder. Math 6170. Spring 2015. Algebraic geometry.

University of Colorado, Boulder. Math 8174. Spring 2014.
Topics in Algebra: Etale cohomology.

University of Colorado, Boulder. Math 6170. Spring 2013.
Algebraic geometry.

University of Colorado, Boulder. Math 6210. Fall 2012.
Algebraic topology I.

UNDERGRADUATE TEACHING

University of Colorado, Boulder. Fall 2018. Linear algebra for math majors.

University of Colorado, Boulder. Math 3135. Spring 2017. Honors linear algebra.

University of Colorado, Boulder. Math 2001. Fall 2016. Discrete mathematics.

University of Colorado, Boulder. Math 2001. Spring 2016. Discrete mathematics.

University of Colorado, Boulder. Math 3110. Spring 2016. Number theory.

University of Colorado, Boulder. Math 2001. Fall 2014. Discrete mathematics.

University of Colorado, Boulder. Math 2001. Spring 2014. Discrete mathematics.

University of Colorado, Boulder. Math 2001. Spring 2014.
Discrete Mathematics.

Unviersity of Colorado, Boulder. Math 3140. Fall 2012.
Abstract algebra I.

Stanford University, Math 52. Spring 2012.
Integral calculus of several variables.

University of British Columbia. Math 221. Winter 2010–2011, Term 1.
Matrix algebra.

University of British Columbia. Math 200. Winter 2009–2010, Term 2.
Calculus III.

Stanford University. Math 51. Fall 2008.
Linear algebra and vector calculus.

Brown University. Math 52. Fall 2007.
Linear algebra.

Brown University. Math 17. Fall 2006.
Advanced placement calculus.

Brown University. Math 17. Fall 2005.
Advanced placement calculus.

Brown University. Math 9. Fall 2004.
Teaching assistant, first-semester calculus.

Brown University. MRC Tutor. Academic year, 2003–2004.

STUDENT RESEARCH PROJECTS

University of Colorado, Boulder. Summer 2017. Research project for students on visualizing Conway's topograph (4 undergraduates).

University of Colorado, Boulder. Summer 2016. Research project on the game of SET (2 graduates, 2 undergraduates).

University of Colorado, Boulder. Spring 2016. Independent study on abelian varieties (6 graduate students and 1 undergraduate).

University of Colorado, Boulder. Summer 2015. Filtrations and Hilbert–Samuel polynomials.

Independent study and honors thesis (Christian Klevdal). Summer 2014 — Spring 2015.

Independent study on category theory (4 graduate students). Spring 2014.

University of Colorado, Boulder. Summer 2014. The pro-étale fundamental group.

University of Colorado, Boulder. Independent study on algebraic curves (Rachel Benefiel). Summer 2013.

Independent study and honors thesis (Dimitrios Economou). Spring 2013—Spring 2014.