Jessica Sidman
Department of Mathematics and Statistics
Mount Holyoke College
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Curriculum Vitae

Education

Ph.D., 2002, University of Michigan.
M.S., 1999, University of Michigan.
B.A., 1997, Scripps College.

Employment

Professor of Mathematics on the John S. Kennedy Foundation, 2017-present.
Professor (and department chair), Mount Holyoke College, 2014-2017.
Associate Professor, Mount Holyoke College, 2009-2014.
Assistant Professor, Mount Holyoke College, 2008-2009.
Clare Boothe Luce Assistant Professor, Mount Holyoke College, 2003-2008

Postdoctoral positions

NSF Postdoctoral Fellow at UC Berkeley, 2002-2003
NSF Postdoctoral Fellow at UMass Amherst, 2004-2005.

Courses taught

FYSEM 110DT, Mathematics of Perspective Drawing (Fall 2021)
FYSEM 110DT, Data Science and Society (Fall 2022)
Math 100, Pre-Calculus (Fall 2009, Fall 2012)
Math 100B, Enriched Calculus (Spring 2006)
Math 101, Calculus I (Spring 2004, Spring 2010, Spring 2013, Spring 2014)
Math 103, Accelerated Calculus (Fall 2005)
Math 120PA, Mathematics of Perspective Drawing (Spring 2018, Fall 2019)
Math 202 (later renumbered 102), Calculus II (Fall 2003, Fall 2006, Spring 2007, Fall 2009, Fall 2010 (3 sections), Spring 2011, Fall 2013 (2 sections), Fall 2015, Spring 2016 (2 sections), Fall 2018)
Math 203, Calculus III (Spring 2005, Spring 2009, Fall 2014 (2 sections), Spring 2015, Fall 2015, Fall 2016)
Math 211, Linear Algebra (Spring 2004, Spring 2006, Spring 2011, Fall 2016)
Math 232, Discrete Mathematics (Fall 2012, Spring 2013, Fall 2013, Spring 2017, Fall 2018, Fall 2019, Spring 2020, Fall 2020 (2 sections), Spring 2021 (2 sections), Fall 2022 (2 sections))
Math 251, Laboratories in Mathematical Experimentation (Fall 2006, Spring 2009)
Math 295, Independent Study (Spring 2014)
Math 301, Real Analysis (Spring 2007, Spring 2010, Spring 2015, Spring 2019)
Math 311, Abstract Algebra (Fall 2003, Fall 2008)
Math 312RT, Ring Theory (Fall 2021)
Math 319 (later renumbered 312GT), Group Theory (Spring 2018, Spring 2023)

Math 319, Algebraic Geometry and Computation (Spring 2014)
Math 322, Differential Geometry (Fall 2005)
Math 329, Topology (Spring 2017)
Math 339FM, Rigidity Theory (Spring 2020, Spring 2023)
Math 395, Independent Study (Fall 2003, Spring 2004, Fall 2004, Spring 2005, Spring 2007, Spring 2009, Fall 2009, J-Term 2010, Spring 2011, Spring 2014 (3), Fall 2014, Spring 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Fall 2019)

Undergraduate research supervision

Sohini Bhatia, Stephanie Einstein, Nana Aba Turkson, Zainab Umar, summer research on rigidity theory and architecture, 2021 (co-supervised with Naomi Darling)

Nikkole Spencer, Janae Davis, and Carla Gonzalez-Vega, 3D printing projects, summer 2017

Maya Urbschat, thesis on polynomial methods in graph theory, 2016

Cecily Santiago, Rose Dennis, and Maya Urbschat, summer research on Borel ideals, 2015 (co-supervised with Jennifer Biermann)

Stephanie Stark, summer research in rigidity theory and cad software, 2014

Dana Fry, thesis on rigidity theory using Groebner covers, 2013

Rigidity Theory REU group, 2012 (co-supervised with Audrey St. John)

Line arrangements REU group, 2009

Aaron Wolbach (UMass undergraduate thesis, from the polytopes REU group), 2005

Polytopes REU group, 2005

Journal publications (*=undergraduate coauthor)

J. Sidman, W. Traves, and A. Wheeler, *Geometric Equations for Matroid Varieties*, Journal of Combinatorial Theory, Series A, **178** (2021)**.**

Z. Rosen, J. Sidman, and L. Theran, *Algebraic Matroids in Action*, The American Mathematical Monthly, **127** (2020), no.3, 199-216.

J. Farre*, H. Kleinschmidt*, J. Sidman, A. St. John, S. Stark*, L. Theran, X. Yu*, *Algorithms for detecting dependencies and rigid subsystems for CAD*, Computer Aided Geometric Design **47** (2016), 130-149.

A. Lee-St.John and J. Sidman, *Combinatorics and the rigidity of CAD systems*, Computer-Aided Design, **45** (2013), no. 2, 473-482.

J. Sidman, *An Introduction to Algebraic Geometry: Polygons, Parameterizations, and Equations*, American Mathematical Monthly, **19** (2012), no.3, 183-198.

J. Sidman and G. Smith, *Linear determinantal equations for all projective schemes*, Algebra and Number Theory, **5** (2012), no. 8, 1041-1061.

J. Sidman and P. Vermeire, *Syzygies of the secant variety of a curve*, Algebra and Number Theory, vol. 3, No. 4, 2009.

J. Sidman and S. Sullivant, *Prolongations and computational algebra*, Canadian J. Math, Vol. 61, No. 4, 2009, p. 930-949.

D. Cox and J. Sidman, *Secant varieties of toric varieties*, J. Pure and Applied Algebra (2007) vol. 209, no. 3, pp. 651-669.

J. Sidman, A. Van Tuyl, and H. Wang, *Multigraded regularity: coarsenings and resolutions.* J. Algebra, (2006) 301, no. 2, 703-727.

J. Sidman and A. Van Tuyl, *Multigraded regularity: syzygies and fat points,* Bëitrage (2006) **47**, no. 1, 67-87. (Due to a mixup of electronic files at the journal an older version was printed, and the correct version is only available online at the journal webpage.)

A. Bjorner, I. Peeva, and J. Sidman, *Subspace arrangements defined by products of linear forms,* J. London Math. Soc., (2005) **71** no.2, 273--288.

A. Conca, J. Sidman, *Generic Initial ideals of points and curves*, J. Symb. Comp. (2005) **40**, 1023--1038.

J. Sidman, *Defining equations of subspace arrangements embedded in reflection arrangements*, IMRN, (2004), no. 15, 713—727.

H. Derksen, J. Sidman, *Castelnuovo-Mumford regularity by approximation*, Adv. in Math. (2004) **188** , no. 1, 104-123.

H. Derksen and J. Sidman, *A sharp bound for the Castelnuovo-Mumford regularity of subspace arrangements*, Adv. in Math., **172** (2002), no. 2, 151--157.

J. Sidman, *On the Castelnuovo-Mumford regularity of products of ideal sheaves*, Adv. in Geom., **2** (2002), no. 3, 219--229.

Preprints

M. DiPasquale, J. Sidman, and W. Traves, *Geometric aspects of the Jacobian of a hyperplane arrangement,* https://arxiv.org/abs/2209.04929.

Conference proceedings

G. Burnham*, Z. Rosen*, J. Sidman, P. Vermeire, *Line arrangements modeling curves of high degree*, Recent Advances in Algebraic Geometry, 52-70, London Mathematical Society Lecture Notes Series, **417**, Cambridge, 2015.

C. Clement*, A. Lee-St.John, J. Sidman, Hyperbanana Graphs, Proceedings of the 25th Canadian Conference on Computational Geometry, (2013), 199-204.

J. Sidman, P. Vermeire, *Equations defining secant varieties: geometry and computation.* Combinatorial aspects of commutative algebra and algebraic geometry, Abel Symp., 6, Springer, Berlin, 2011.

Book chapters

J. Sidman, *Polynomials and Rigidity Theory*, in Applications of Polynomial Systems, D. Cox with contributions from Carlos D'Andrea, Alicia Dickenstein, Jonathan Hauenstein, Hal Schenck, and Jessica Sidman, CBMS Regional Conference Series in Mathematics, Vol. 134, 2020.

J. Sidman and W. Traves, "Cayley Factorization and Special Positions" in the Handbook of Geometric Constraint Systems Principles, 85-106, Chapman and Hall/CRC, New York, 2018.

H. Schenck and J. Sidman, "Commutative algebra of subspace arrangements and hyperplane arrangements*,"* in *Commutative Algebra: Expository Papers Dedicated to David Eisenbud on the Occasion of His 65th Birthday*, 639-666, Springer Verlag, New York, 2013.

J. Sidman, "Resolutions and Subspace arrangements" in *Syzygies and Hilbert Functions*, 249-265, Lect. Notes Pure Appl. Math., 254, Chapman&Hall/CFC, Boca Raton, FL, 2007.

D. Eisenbud, Lectures on the geometry of syzygies. With a chapter by Jessica Sidman. Math. Sci. Res. Inst. Publ., 51, *Trends in Commutative Algebr*a, 115-152, Cambridge Univ. Press, Cambridge, 2004.

Notes

C. Hacon and J. Sidman, *Lessons From Our advisor*, Notices of The American Mathematical Society, Volume 68, Number 8, September 2021, pp. 1313-1315.

J. Sidman, *Congratulations! You have Tenure! And Now What?*, Notices of The American Mathematical Society, Volume 66, Number 9, October 2020, pp. 1442-1444.

J. Sidman, *Thoughts on Helping Students to Feel Included,* Notices of The American Mathematical Society, Volume 66, Number 7, August 2020, pp. 1047-1048.

J. Sidman and A. St. John, *The Rigidity of Frameworks: Theory and Applications*, Notices of The American Mathematical Society, Volume 64, Number 9, October 2017, pp. 973-977.

Awards

Merten M. Hasse Prize (joint with Zvi Rosen and Louis Theran)
Algebraic Matroids in Action, The American Mathematical Monthly, **127** (2020), no.3, 199-216.

Best Paper Award
Symposium on Solid and Physical Modeling, SPM 2012
University of Burgundy, Dijon, France, October 29-31st, 2012.

2012 Meribeth E. Cameron Faculty Award for Scholarship
Mount Holyoke College, 2012.

Conference talks

Special Session on Matroids and RigidityTheory
Southeastern Int'l Conference on Combinatorics, Graph Theory & Computing, March 10, 2022

Virtual Discrete Math 2-Day at Albany
Hosted virtually by SUNY Albany, April 26, 2020.

Texas Algebraic Geometry Seminar 2019
Texas A&M University, College Station, October 5th, 2019.

Algebraic Geometry Northeast Section
UMass Amherst, Amherst, March 22, 2019.

Combinatorial Algebra
AWM Research Symposium 2019, Rice University, Houston, April 7, 2019.

AMS Special Session on Commutative Algebra and Complexity
University of Michigan, Ann Arbor, October 20, 2019.

Applications of Polynomial Systems an NSF/CBMS Regional Conference in the Mathematical Sciences
Texas Christian University, Fort Worth, June 7, 2018.

AMS Special Session on Gaussian Graphical Models and Combinatorial Algebraic Geometry
Atlanta, January 4, 2017**.**

Geometry Rigidity Theory and Applications
International Centre for Mathematical Sciences, Edinburgh, June 2, 2016.

Minimal Free Resolutions, Betti Numbers, and Combinatorics
International Centre for Mathematical Sciences, Edinburgh, June 4, 2015.

AMS-SIAM Special Session on Mathematics of Computation: Algebra and Number Theory
San Diego, January 11, 2013.

SIAM Mini-symposium: Combinatorial Algebraic Geometry
Minneapolis, July 11, 2012.

Special session: Algebraic Geometry and Commutative Algebra
AWM Anniversary Conference at Brown University September 17, 2011.

AMS Special Session on The Algebraic Geometry and Topology of Hyperplane Arrangements

College of the Holy Cross, April 9th, 2011

Combinatorial Algebra meets Algebraic Combinatorics

Lakehead University,January 22nd, 2011

Abel Symposium I
Voss, Norway, June 2, 2009.

Commutative algebra and its interactions with algebraic geometry
Banff International Research Station, Banff, Canada, June 11, 2007.

AMS special session: toric varieties
Rutgers University, New Brunswick, October 6, 2007.

Hilbert Functions and syzygies in commutative algebra and combinatorics
Cortona, Italy, September 18, 2007.

Castelnuovo-Mumford regularity and related topics I
CIRM, Luminy, May 12, 2006.

AMS special session: combinatorial algebraic geometry I
Notre Dame University, South Bend, April 9, 2006.

AMS special session: algebraic statistics
Joint Meetings, San Antonio, January 13, 2006.

Conference of the School on Commutative Algebra and Interactions with Algebraic Geometry and Combinatorics
Trieste, Italy, June 10, 2004.

Workshop on Combinatorial Aspects of Hyperplane Arrangements

MSRI, Berkeley, November 1, 2004.

Tutorials and short courses

Analytic and Algebraic Geometry: Common Problems – Different Methods. Undergraduate Summer School Lecturer
Park City Mathematics Institute, Park City, July 21-26 2008.

Women and mathematics: Algebraic Geometry and Group Actions
Institute for Advanced Studies, Princeton, May 21-24, 2007.

Tutorial: What is algebraic geometry?
Institute for Mathematics and Its Applications, Minneapolis, April 13, 2007.

Colloquia and seminars

Matroids – Combinatorics, Algebra, and Geometry Seminar
Fields Institute, October 11, 2022

Algebraic Geometry Seminar
Stony Brook University, April 6, 2022

AWM Distinguished Speaker Series
University of Oregon, January 11, 2022

Taters
Boise State University, October 22, 2021

Mathematics Department Colloquium Series
US Naval Academy, October 13, 2021

Virtual seminar on algebraic matroids and rigidity theory
MIT, May 21, 2020.

MAXIMALS Algebra Seminar
University of Edinburgh, December 4, 2017

Pure Mathematics Colloquium
St. Andrews University, November 30, 2017

Colloquium
Wesleyan University March 3, 2011

Colloquium
Canada/USA Mathcamp July 6th, 2010

Valley Geometry Seminar
UMass, Amherst February 5, 2010

Reed Mathematics Colloquium
October 25, 2007.

Queen's algebraic geometry seminar
Queen's University, Kingston, Canada, January 17, 2005 and November 5, 2007.

University of Connecticut Department Colloquium
November 15, 2007.

Department Colloquium
Wellesley College, March 14, 2005.

Algebraic geometry seminar
University of Michigan, Ann Arbor, October 12, 2004.

Algebraic geometry seminar
Università di Genova, Italy, June 15, 2004.

Mathematics Colloquium
SUNY Albany, April 23, 2004.

Geometry-Algebra-Singularities-Combinatorics seminar
Northeastern University, Boston, March 15, 2004.

Claremont Colleges Mathematics Colloquium
Pomona College, November 13, 2002.

Local expository talks

Math Forum
Smith College April 6th, 2017

REU Colloquium
Yale University, June 27, 2016.

Math Forum
Smith College February 14th, 2013.

Prime Time Talk
Hampshire College Summer Studies in Mathematics July 13th, 2010

Math Club
University of Connecticut October 6th, 2010

Prime Time Talk
Hampshire College Summer Studies in Mathematics July 28, 2009

Math Forum
Smith College September 22, 2009

Working commutative algebra/algebraic geometry seminar: Green's conjecture
University of Massachusetts, Amherst, February 8, 15, 29, 2008.

Westfield State Math Club
Westfield State College, Westfield, October 16, 2007.

The "What is ...?" seminar
UMass, Amherst, April 9, 2004 and March 29 and April 5, 2007.

Minimal Model Program Seminar
UMass, Amherst, April 20, 2007.

Working commutative algebra seminar
UMass, Amherst, September 17 and November 12, 2004, and February 25, 2005.

Combinatorics Study Group
Mount Holyoke College, October 21, 2004.

Workshops and Conferences attended

The Grading Conference
Virtual, June 3-4, 2022.

Women in Commutative Algebra and Algebraic Geometry
Fields Institute (virtual), February 5-6 and June 3, 2022

Grants and fellowships

Hudson River Undergraduate Math Conference Grant
Co-PI (with Giuliana Davidoff, Margaret Robinson, Dylan Shepardson), NSF Conference Grant.

ICMS Research in Groups: Graph Rigidity and Control of Robot Formations. CoPI (with Bernd Schulze, Anthony Nixon, Audrey St. John, Louis Theran, Daniel Zelazo), July 25 – August 3, 2022.

Ideals, Varieties, and Applications
Co-PI (with Nathan Pflueger, Gregory Call, Robert Benedetto), NSF Conference Grant, DMS-1903186.

RUI: Computational and Combinatorial Commutative Algebra
NSF grant DMS-0600471, 2006-2009.

NSF Mathematical Sciences Postdoctoral Research Fellowship
NSF grant DMS-0201607

Selected Department Service

Search chair, Problem Solving Club Advisor, Math Modeling Club Advisor, Math/Stat/DS Lunch coordinator, TA and Grader coordinator, Course assignments and scheduling

Selected service at Mount Holyoke

Faculty Advisor for the Student AWM Chapter, 2022-2023

Faculty Advisor for STEMPOC, 2022-2023

Faculty Marshall, 2022-present

Advisory Committee on Appointments, Reappointments and Promotion 2016-2020

Department Chair, 2014-2017

Faculty Planning and Budget Committee, 2016, 2006-2011.

Faculty Conference Committee, 2012-2103

College Planning Committee, 2010-2011

Disciplinary Service

Co-organizer of the Workshop on Real Algebraic Geometry and Algorithms for Geometric Constraint Systems
Fields Institute, June 14-18, 2021.

Education Advisory Board
ICERM, Brown University 2019-2022.

Co-organizer: Discrete Math Day
November 16, 2019

Co-organizer: Ideals, Varieties, and Applications
Amherst College, June 10-14, 2019.

Co-director: Career Mentoring Workshop
Mount Holyoke College, June 24-26, 2018.

Co-organizer: Algebraic methods in rigidity theory mini-symposium
SIAM AG '17, Georgia Tech, August 1, 2017.

Co-organizer: Combinatorial Algebraic Geometry: Introductory Workshop
Fields Institute in August, 2016.

Co-organizer: Algebraic Geometry Northeast Section Workshop
UMass, Amherst, March 31-April 1st, 2012.

Co-organizer: Algebraic Geometry Northeast Section Poster Session
UMass, Amherst, April 9-11, 2010.

Co-organizer: Connections for Women: Algebraic Geometry and Related Fields
MSRI, January 26-30, 2009.

Co-coordinator of the Sky Dot Project NExT sessions for Mathfest
Providence, August 11, 2004.

A Walk Through the Math Pipeline from End to End (sponsored by the Committee on Science Policy and the Committee on the Professions)
Panelist, Joint Mathematical Meeting, Phoenix, January 9, 2004.

Editorial work

Associate Editor for the American Mathematical Monthly
Series Editor for Undergraduate Texts in Mathematics, Springer-Verlag.

Refereeing

Advances in Mathematics
SIAM Journal of Applied Algebraic Geometry
Combinatorica
Proceedings of the American Mathematical Society
Journal of the London Mathematical Society
Journal of Algebra
Journal of Symbolic Computation
Journal of Algebraic Geometry