David Jensen

University of Kentucky, Department of Mathematics **Citizenship: USA**
Lexington, KY 40506 **Phone: 512-569-4483**
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EMPLOYMENT   **University of Kentucky**, Kentucky, USA

Wimberly Royster Research Professor July 2020 - July 2023
Associate Professor June 2019 - present
Assistant Professor August 2013 - June 2019

Stony Brook University, New York, USA

Simons Postdoc August 2010 - 2013

EDUCATION   **University of Texas**, Texas, USA

Ph.D., Mathematics May 2010
- Thesis Topic: Birational geometry of $\overline{M}_{g,1}$
- Advisor: Sean Keel

Williams College, Massachusetts, USA

B.A., Highest Honors in Mathematics and Philosophy June 2004
- Thesis Topic: Completions of UFDs with Semi-Local Formal Fibers
- Advisor: Susan Loepp

VISITING POSITIONS   **Yale University**, Connecticut, USA August 2013 - August 2014
January - May 2016
June - December 2017

PUBLICATIONS AND PREPRINTS

38 *Group Theory via Quilts*
with K. Ponto, Mitteilungen der Deutschen Mathematiker-Vereinigung, 31, no. 4 (2023) 218–219.

37 *On the Semigroup of Graph Gonality Sequences*
with A. Fessler, E. Kelsey, and N. Owen (submitted).

36 *The Embedding Theorem in Hurwitz-Brill-Noether Theory*
with K. Cook-Powell, E. Larson, H. Larson, and I. Vogt (submitted).

35 *Sliding Block Puzzles with a Twist: On Segerman's $15 + 4$ Puzzle*
with P. Garcia, A. Hanson, and N. Owen, (submitted).

34 *Tropical Linear Series and Tropical Independence*
with S. Payne, (submitted).

33 *Chip Firing and Algebraic Curves*
Notices of the AMS, December (2021) 1875–1881.

32 *Recent Developments in Brill-Noether Theory*
with S. Payne
EMS Volume for the BMS Einstein Semester on Algebraic Geometry (to appear.)

31 *The Nonabelian Brill-Noether Divisor on $\overline{M}_{13}$ and the Kodaira Dimension of $\overline{R}_{13}$*
with G. Farkas and S. Payne
Geometry and Topology (to appear).

30 *Tropical Methods in Hurwitz-Brill-Noether Theory*
with K. Cook-Powell
Advances in Mathematics, 398 (2022).

29 *The Kodaira Dimensions of $\overline{M}_{22}$ and $\overline{M}_{23}$*
with G. Farkas and S. Payne, (submitted).

28 *A New Lower Bound on Graph Gonality*
with M. Harp, E. Jackson and N. Speeter
Discrete Applied Mathematics, 309 (2022), 172–179.

27 *Scrollar Invariants of Tropical Curves*
with K. Sawyer, (submitted).

26 *The Motivic Zeta Functions of a Matroid*
with M. Kutler and J. Usatine
J. London Math. Soc. (2020).

25 *Components of Brill-Noether Loci for Curves with Fixed Gonality*
with K. Cook-Powell
Michigan Math Journal (2021), 1–27.

24 *Brill-Noether Theory for Curves of a Fixed Gonality*
with D. Ranganathan
Forum of Math Pi, 9 (2021), 1–33.

23 *Brill-Noether Theory of Curves on $\mathbb{P}^1 \times \mathbb{P}^1$: Tropical and Classical Approach*
with F. Cools, M. D'Adderio and M. Panizzut
Alg. Combin. 2 (2019), no. 3, 323-341.

22 *Combinatorial and Inductive Methods for the Tropical Maximal Rank Conjecture*
with S. Payne
Journal of Combinatorial Theory, Series A, 152 (2017), 138-158.

21 *Gonality of Expander Graphs*
with N. Dutta
Discrete Mathematics, 341(9) (2018), 2535—2543.

20 *Tropicalization of Theta Characteristics, Double Covers, and Prym Varieties*
with Y. Len
Selecta Mathematica 24 (2), 1391–1410.

19 *Tropical Independence II: The Maximal Rank Conjecture for Quadrics*
with S. Payne
Algebra and Number Theory, 10(8) (2015).

18 *Degeneration of Linear Series From the Tropical Point of View and Applications*
with M. Baker
Proceedings of Simons Symposium on Nonarchimedean Geometry.

17 *Toric Graph Associahedra and Compactifications of $M_{0,n}$*
with R. Feirrera da Rosa and D. Ranganathan
Journal of Algebraic Combinatorics, 43(1), 139-151.

16 *Realization of Groups with Pairing as Jacobians of Finite Graphs*
with L. Gaudet, D. Ranganathan, N. Wawrykow and T. Weisman
Annals of Combinatorics, 22(216).

15 *Gonality of Random Graphs*
with A. Deveau, J. Kainic and D. Mitropolsky
Involve, a Journal of Mathematics, 9-4 (2016), 715-620. DOI 10.2140/involve.2016.9.715

14 *The Locus of Brill-Noether General Graphs is Not Dense*
Portugalia Mathematica, 73(3) (2016).

13 *Lifting Divisors on a Generic Chain of Loops*
with D. Cartwright and S. Payne
Canadian Mathematical Bulletin, 58 (2015).

12 *Tropical Independence I: Shapes of Divisors and a Proof of the Gieseker-Petri Theorem*
with S. Payne
Algebra and Number Theory, 8(9) (2014).

11 *A Simplicial Approach to the Effective Cone of $\overline{M}_{0,n}$*
with B. Doran and N. Giansiracusa
International Mathematics Research Notices, (2017) (2):529-565.

10 *Log Canonical Models and Variation of GIT for Genus 4 Canonical Curves*
with S. Casalaina-Martin and R. Laza
Journal of Algebraic Geometry 23 (2014), 727-764.

9 *GIT Compactifications of $M_{0,n}$ and Flips*
with N. Giansiracusa and H. Moon
Advances in Mathematics 248 (2013), 242-278.

8 *Veronese Quotient Models of $\overline{M}_{0,n}$ and Conformal Blocks*
with A. Gibney, H. Moon and D. Swinarski
Michigan Mathematical Journal 62 (2013), 721-751.

7 *Towards a Tropical Proof of the Gieseker-Petri Theorem*
with V. Baratham, C. Mata, D. Nguyen and S. Parekh
Collectanea Mathematica 65 (2014), 17-27.

6 *Stability of Second Hilbert Points of Canonical Curves*
with M. Fedorchuk
International Mathematics Research Notices (2012).

5 *Geometry of the Ball Quotient Model of the Moduli Space of Genus 4 Curves*
with S. Casalaina-Martin and R. Laza
Compact Moduli Spaces and Vector Bundles, Contemp. Math. 564 (2012).

4 *Rational Fibrations of $\overline{M}_{5,1}$ and $\overline{M}_{6,1}$*
Journal of Pure and Applied Algebra 216 (2012), 633-642.

3 *Birational Contractions of $\overline{M}_{3,1}$ and $\overline{M}_{4,1}$*
Transactions of the American Mathematical Society 365 (2013), 2863-2879.

2 *Completions of UFDs with Semi-Local Formal Fibers*
Communications in Algebra, 34, 347-360 (2006).

1 *Controlling Formal Fibers of Principal Prime Ideals*
with A. Dundon, S. Loepp, J. Provine, and J. Rodu
Rocky Mountain Journal of Mathematics, 37, 1871-1891 (2007).

HONORS AND AWARDS	NSF Standard Grant DMS-2054135	Summer 2021 - Summer 2024
	NSF Standard Grant DMS-1601896	Fall 2016 - Fall 2020
	AMS Simons Travel Grant	Summer 2013 - Summer 2016
	NSF Research Training Grant Fellowship	Spring 2008
	Frank Gerth III Graduate Excellence Award	Fall 2005
	Rosenberg Prize for Excellence in Mathematics	Spring 2004

PROFESSIONAL SERVICE	Two NSF Panels	
	Organizer of Eaves Lecture	Fall 2022
	Co-Organizer of Hayden-Howard Lecture	Spring 2019
	Organizer for AIM Workshop on Foundations for Tropical Schemes	Spring 2017
	Organizer for MSRI Summer School on Chip-Firing and Tropical Curves	Summer 2016
	Organizer for Conference on Tropical and Nonarchimedean Analytic Geometry of Moduli Spaces at Casa Matematica Oaxaca	Spring 2016
	US Based Organizer for Géométrie Algébrique en Liberté	Spring 2013

Referee for: Advances in Geometry, Advances, Algebra and Number Theory, Annali di Matematica Pura ed Applicata, Arkiv for Matematik, Australasian Journal of Combinatorics, Bulletin of the Belgian Mathematical Society, Canadian Journal of Mathematics, CEJM, Collectanea, Communications in Algebra, Compositio, Contemp. Math., Crelle, Discrete Applied Math., Discrete Mathematics, Documenta, Duke, European Journal of Combinatorics, European Journal of Mathematics, Experimental Mathematics, Forum of Math Pi, Forum of Mathematics Sigma, Glasgow Mathematical Journal, IMRN, JEMS, Journal of Algebraic Combinatorics, Journal of the London Math Society, La Matematica, Math Annalen, Mathematical Proceedings of the Cambridge Philsophical Society, Mathematische Nachrichten, Manuscripta, Michigan Math Journal, MRL, Portugalia, Proceedings of the AMS, Proceedings of the AMS Summer Institute, Proceedings of Combinatorial Algebraic Geometry Thematic Program, Proceedings of the London Math Society, Selecta, Transactions of the AMS

UNIVERSITY OF KENTUCKY SERVICE	Project Leader and Director of Communcations for UK Math Lab	Spring 2018 - present
	Royster Professorship Nominating Committee	Spring 2023
	Chair Search Committee	Spring 2021
	Speaker at A Night of Mathematical Musings	Spring 2020
	Graduate Recruiting Committee	Spring 2020
	Algebra Prelim Committee	Spring 2017 - Fall 2019, Spring and Fall 2021, Spring 2023
	Tenure-Stream Hiring Committee	Fall 2016, Spring 2017, Fall 2018, and Spring 2019
	Organizer of Algebra and Geometry Seminar	Spring 2015 - Spring 2017, Fall 2023-present
	Graduate Program Committee	Fall 2016, Spring 2017, Fall 2021 and Spring 2022
	Undergraduate Committee	Fall 2015 and Spring 2016
	Faculty Student Mentoring Program	Fall 2015
	AWM Job Search Panel	Spring 2015
	Volunteer for University of Kentucky High School Math Day for Women	Fall 2014
	Speaker for Central Kentucky Math Circle	Spring 2015 and Fall 2016

PHD STUDENTS SUPERVISED	Kalila Sawyer	PhD 2020
	Kaelin Cook-Powell	PhD 2021
	Noah Speeter	PhD 2023
	Angela Hanson	PhD 2023
	Eric Burkholder (unqualified)	PhD expected 2026
	Doel Rivera Laboy (unqualified)	PhD expected 2026

POSTDOCTORAL FELLOWS	Max Kutler	2018 – 2021

UNDERGRADUATE RESEARCH SUPERVISED

UK Math Lab project with Marissa Morvai, Ben Welch, and Sydney Yeomans

UK Math Lab project with Marissa Morvai, Noah Owen, and Sydney Yeomans

UK Math Lab project with Austin Fessler, Kate Kelsey, and Noah Owen

UK Math Lab project with Patrick Garcia and Noah Owen

UK Math Lab project with Michael Harp and Elijah Jackson

UK Math Lab project with Alex Blose, Ben Cortas, Madison Howard, Elijah Jackson and Jackson Morris

Independent Study project with Mae Cotton

UK Math Lab project with Madison Howard and Elijah Jackson

UK Math Lab project with Jessica Appel, Jackson Morris, and Kristopher Andrew

Independent research project with Neelav Dutta at University of Kentucky

SUMRY project with Louis Gaudet, Nick Wawrykow, and Teddy Weisman at Yale

SUMRY project with Andrew Deveau, Jenna Kainic, and Dan Mitropolsky at Yale

SUMRY project with Rodrigo Ferreira da Rosa at Yale

Independent research project with Vyassa Baratham, Cristina Mata, Dat Nguyen, and Shalin Parekh at SUNY Stony Brook

SERVICE AT PRIOR INSTITUTIONS

Mentor for Summer Undergraduate Math Research at Yale	Summer 2014
Department Liaison to the Yale Undergraduate Math Society	Fall 2013 and Spring 2014
Speaker for Brookhaven National Labs Gifted Math Program	Spring and Fall 2012
Coordinator of Undergraduate Research Group on Tropical Geometry	Spring 2012
Faculty Sponsor of the Stony Brook Slack-Line Club	Fall 2011 and Spring 2012
Organizer of Academic Job Search Panel	Spring 2010
Organizer of Saturday Morning Math Group/Austin Math Circle	Spring and Fall 2009
Observer for Inquiry-Based Learning Mathematics Project	Fall 2008 and Spring 2009
Volunteer for Explore UT Day (college-wide open house)	Spring 2008 and Spring 2009
Developer and Organizer of Introduction to Algebraic Geometry Seminar	Fall 2007
Inaugural Speaker for UT Math Club	Fall 2007
Mentor (with tenure) at Canada/USA Mathcamp	Summer 2007
Mentor for Intellectual Entrepreneurship Pre-Grad Internship	Spring 2007 and Fall 2008
Organizer of Sophomore Exploratory Seminar	Spring and Fall 2006

- *A Tropical Approach to the Strong Maximal Rank Conjecture*
  Brill-Noether Conference, Hubmboldt Universitat, Berlin, Germany November 2019
- *Tropical Brill-Noether Theory*
  Roma Tre University   May 2017
- *Moduli Spaces of Curves and Their Birational Geometry*
  Summer School on Algebraic Geometry, Yangyang, South Korea   June 2012

- *Sliding Block Puzzles with a Twist*
  The Ohio State University, Columbus, OH   October 2022
- *Nonabelian Brill-Noether Theory of Genus 13 Curves*
  VBAC, Tufts University, MA (remote)   January 2022
- *The Kodaira Dimensions of Moduli Spaces of Curves*
  LMS-Bath Symposium, Bath, UK   August 2022
  Brown University, Providence, RI   March 2022
  ICM Satellite Conference, Cabo Frio, Brazil   August 2018
  Tufts University   March 2018
  AMS Sectional, The Ohio State University   March 2018
  Georgia Algebraic Geometry Symposium, Georgia Tech University February 2018
- *Linear Systems on General Curves of Fixed Gonality*
  University of Arizona (remote)   September 2020
  Purdue University (remote)   September 2020
  BATMOBYLE, Brown University   November 2019
  I-70 Conference, WUSTL   November 2019
  Amherst College   April 2019
  The Ohio State University   February 2019
  Stanford University   November 2018
  Central Michigan University   October 2018
  University of Tennessee   September 2018
  University of Texas   November 2017
  Harvard University   October 2017
  Rutgers University   October 2017
  Roma Tre University   May 2017
  Combinatorial Moduli Spaces, Fields Institute   December 2016
- *A Nonarchimedean Analytic Approach to the Geometry of General Curves*
  Geometry at the ANU, Canberra, Australia   August 2016
  New Methods in Birational Geometry, University of Toulouse, France   June 2016
- *Tropicalization of Theta Characteristics*
  Rice University   October 2016
  BATMOBYLE, Yale University   April 2016
  University of Virginia   April 2016
- *Tropical Independence and the Maximal Rank Conjecture for Quadrics*
  AMS Sectional, University of Georgia   March 2016
  AGNES, Brown University   October 2015
  University of Illinois, Chicago   September 2015
  Workshop on Degenerations in Algebraic Geometry, AIM, San Diego August 2015
  AMS Summer Institute in Algebraic Geometry, University of Utah   July 2015
- *Gonality of Random Graphs*
  Williams College   September 2017
  Waterloo University, Canada   November 2015
  University of Tennessee   September 2014
  Fordham University   July 2014
- *Tropical Brill-Noether Theory and the Gieseker-Petri Theorem*

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Simons Symposium on Nonarchimedean Geometry, Puerto Rico	February 2015
University of Georgia	December 2014
Emory University	October 2014
The Ohio State University	April 2014
Harvard University	April 2014
Banff International Research Station, Canada	March 2014
Yale University	October 2013

- *A Non-Reductive Approach to the Effective Cone of $\overline{M}_{0,n}$*

Courant Institute	September 2013
Conference on Moduli and Birational Geometry, Pohang, South Korea	August 2013

- *Hassett-Keel Program in Genus Four*

University of Georgia	March 2013
Oklahoma State University	February 2013
University of Kentucky	January 2013
University of South Carolina	January 2013
American Institute of Mathematics	December 2012
The Ohio State University	December 2012
Columbia University	November 2012
Princeton University	October 2012
Stony Brook University	April 2012
Workshop on Moduli and Birational Geometry, Gyeongju, South Korea	July 2011

- *Flips Between Compactifications of $M_{0,n}$*

Boston College	April 2013
University of Texas	September 2012
Rice University	September 2012
Yale University	September 2012
University of Georgia	January 2012
University of Massachusetts, Amherst	October 2011

- *Curves, Chip Firing, and Catalan Numbers*

Fordham University	July 2014
Washington and Lee University	February 2013

- *Towards a Tropical Proof of the Gieseker-Petri Theorem*

University of Colorado Colloquium	November 2012
Simons Postdoctoral Fellows Meeting	April 2012

- *Beyond the Boundary: Log Minimal Models for the Moduli Space of Curves*

University of Colorado	November 2012
Joint Mathematics Meetings, Special Session on Algebraic Geometry	January 2011
Stony Brook University	September 2010

- *Rational Fibrations of $\overline{M}_{g,1}$*

Workshop on Moduli and Birational Geometry, Busan, South Korea	July 2012
Brown University	March 2011
Rice University	April 2010
University of Texas	October 2009
Texas A & M University	March 2009

TEACHING
EXPERIENCE

Classes Taught at University of Kentucky

- Math and Democracy	Fall 2022 and Spring 2023
- Calculus I for the Life Sciences	Spring 2020 and 2022
- Modern Algebra	Fall 2015 and Spring 2020
- Rings and Modules	Fall 2019 and 2021
- Chip Firing	Spring 2019
- Matrix Algebra	Fall 2018

- Introduction to Algebraic Geometry   Spring 2018 and Fall 2022
- History of Math   Spring 2018, Fall 2021 and Fall 2023
- Graduate Modern Algebra   Fall 2016, Spring 2017, Fall 2023 and Spring 2024
- Calculus I   Spring 2017 and Fall 2018
- Graduate Linear Algebra   Fall 2015
- Introduction to Algebraic Curves   Spring 2015
- Calculus IV   Fall 2014
- Introduction to Number Theory   Fall 2014

Classes Taught at Yale University

- Undergraduate Algebraic Geometry   Spring 2016
- Tropical Brill-Noether Theory   Spring 2016
- Calculus I   Spring 2014
- Algebraic Curves and Linear Series   Fall 2013

Classes Taught at Stony Brook University

- Graduate Problem Seminar   Fall 2011 and 2012
- Differential Equations with Linear Algebra   Spring 2012
- Logic, Language and Proof   Fall 2011
- Mathematical Puzzles and Games   Spring 2011
- Introduction to Mathematical Thinking   Spring 2011
- Calculus B   Spring 2013 and Fall 2010

Assistant Instructor Positions Held at the University of Texas

- Saturday Morning Math Group and Austin Math Circle   Spring and Fall 2009
- Foundations of Arithmetic   Fall 2008

Classes Taught at Canada/USA Mathcamp   Summer 2007

- Algebraic Geometry
- Nonstandard Analysis
- Mathematics of Juggling
- Mathematics of Elections
- Constructible of Not?
- How to Win the Finite Group Game

STUDENT EXAMINATION COMMITTEES	
Ali Alsteri	Qualifying, February 2023
Kaelin Cook-Powell	Masters, February 2018
	Qualifying, January 2020
	PhD, June 2021
Sarah Church	Qualifying, April 2023
Joe Cummings	Masters, September 2018
	Qualifying, March 2019
Jessica Doering	Masters, April 2018
Courtney George	Masters, September 2019
	PhD, May 2023
Will Gustafson	Qualifying, November 2019
	PhD, April 2023
Angela Hanson	Masters, October 2019
	Qualifying, March 2021
	PhD, April 2023

Isaiah Harney	Masters, October 2014
Casey Hill	Qualifying, November 2022
Eric Kaper	Masters, September 2015
	Qualifying, December 2015
Anupam Kumar	Masters, April 2017
Hunter Lehmann	Masters, April 2018
	Qualifying, November 2018
	PhD, June 2021
Marie Meyer	Qualifying, October 2016
	PhD, April 2018
Michael Morrow	Masters, April 2021
	Qualifying, December 2022
McCabe Olsen	Masters, April 2015
Darleen Perez-Lavin	PhD, March 2021
Rachel Petrik	Qualifying, April 2017
	PhD, April 2020
Robert Pfeiffer	Qualifying, January 2017
	PhD, April 2018
Ya Qi	PhD, July 2022
Eric Roemmele	PhD, April 2019
Felix Röhrle	PhD, January 2023
Kalila Sawyer	Masters, April 2017
	Qualifying, February 2018
	PhD, March 2020
Noah Speeter	Qualifying, March 2021
	PhD, May 2023
Bill Trok	Qualifying, October 2016
	PhD, April 2020
Menghan Wang	PhD, April 2023
Jay White	Masters, November 2016
	Qualifying, September 2017
	PhD, April 2021
Xiaowen Zhan	PhD, October 2018