

Juliette Bruce

Curriculum Vitae

Department of Mathematics
University of Wisconsin
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Education

- **University of Wisconsin** Madison, WI
Ph.D. Mathematics 2014 – Present
– Advisor: Daniel Erman
- **University of Wisconsin** Madison, WI
M.A. Mathematics 2014 – 2016
- **University of Michigan** Ann Arbor, MI
B.S. in Mathematics & Political Science 2010 – 2014
– With High Honors and Distinction

Research Interests

Algebraic Geometry, Commutative Algebra, Arithmetic Geometry, Non-linear Algebra

Publications

10. J. Bruce. The Quantitative Behavior of Asymptotic Syzygies for Hirzebruch Surfaces. *Submitted*. E-Print: [arXiv:1906.07333](https://arxiv.org/abs/1906.07333).
9. J. Bruce, D. Erman, S. Goldstein, and J. Yang. The SchurVeronese package in Macaulay2. *Submitted*. E-print: [arXiv:1905.12661](https://arxiv.org/abs/1905.12661).
8. A. Almousa, J. Bruce, M. Loper, and M. Sayrafi. The Virtual Resolutions Package for Macaulay2. *Submitted*. E-print: [arXiv:1905.07022](https://arxiv.org/abs/1905.07022).
7. J. Bruce. Asymptotic Syzygies in the Setting of Semi-Ample Growth. *Submitted*. E-Print: [arXiv:1904.04944](https://arxiv.org/abs/1904.04944)
6. J. Bruce and W. Li. Effective bounds on the dimensions of Jacobians covering abelian varieties. *Proc. Amer. Math. Soc.*, Accepted. E-print: [arXiv:1804.11015](https://arxiv.org/abs/1804.11015).
5. J. Bruce, D. Erman, S. Goldstein, and J. Yang. Conjectures and computations about Veronese syzygies. *Experimental Mathematics*, To Appear. E-print: [arXiv:1711.03513](https://arxiv.org/abs/1711.03513).
4. M. Brandt, J. Bruce, T. Brysiewicz, R. Krone, and E. Robeva. The degree of $SO(n)$. *Combinatorial Algebraic Geometry*, 207-224, Fields Inst. Commun. **80**, (2017). E-print: [arXiv:1701.03200](https://arxiv.org/abs/1701.03200).

3. J. Bruce and D. Erman. A probabilistic approach to systems of parameters and Noether normalization. *Algebra and Number Theory*, Accepted. E-print: [arXiv:1604.01704](https://arxiv.org/abs/1604.01704).
2. J. Bruce, M. Logue, and R. Walker. Monomial valuations, cusp singularities, and continued fractions. *Journal of Commutative Algebra*, **7** (2015) no. 4, 495-522. E-print: [arXiv:1311.6493](https://arxiv.org/abs/1311.6493).
1. J. Bruce, P. Kao, E. Nash, B. Perez, and P. Vermeire. Betti tables of reducible algebraic curves. *Proc. Amer. Math. Soc.* **142** (2014) 4039-4051. E-print: [arXiv:1210.3064](https://arxiv.org/abs/1210.3064).

Grants

- **Conference Grant DMS-1908799 – \$15,000** March 2019
National Science Foundation
- **Graduate Research Fellowship** 2015 – 2018
National Science Foundation
- **Conference Grant DMS-1812462 – \$15,000** February 2018
National Science Foundation
- **Professional Development Grant – \$1000** December 2016
Graduate School – University of Wisconsin

Awards, Grants & Honors

- **Elizabeth Hirschfelder Prize** October 2018
Dept. of Mathematics - University of Wisconsin
- **Mathematics TA Service Award** April 2018
Dept. of Mathematics - University of Wisconsin
- **Teaching Assistant Award for Exceptional Service** February 2018
University of Wisconsin (Campus Wide)
- **Outstanding Achievement in Mathematics** May 2014
Dept. of Mathematics – University of Michigan
- **Phi Beta Kappa** April 2014
University of Michigan
- **Chancellor’s Opportunity Award** April 2014
University of Wisconsin

Research Presentations

- **Asymptotic Syzygies for Products of Projective Space** MPI Leipzig
Summer School on Randomness and Learning in Non-Linear Algebra July 2019
- **Asymptotic Syzygies in the Semi-Ample Setting (Poster)** MPI Leipzig
Summer School on Randomness and Learning in Non-Linear Algebra July 2019

- **Semi-Ample Asymptotic Syzygies**
Algebraic Geometry Seminar Stanford University
May 2019
- **Asymptotic Syzygies for Products of Projective Space**
Algebra Seminar University of Kentucky
April 2019
- **Semi-Ample Asymptotic Syzygies**
Commutative Algebra Seminar University of Minnesota
April 2019
- **Asymptotic Syzygies for Products of Projective Space (Poster)**
2019 AWM Research Symposium Poster Session Rice University
April 2019
- **Asymptotic Syzygies for Products of Projective Space**
KUMUNUjr. University of Nebraska
March 2019
- **Asymptotic Syzygies for Products of Projective Space**
Spring AMS Southeastern Sectional Auburn University
March 2019
- **Asymptotic Syzygies for Products of Projective Space**
Joint Math Meetings Baltimore, MD
January 2019
- **Covering Abelian Varieties and Effective Bertini**
Algebra and Algebraic Geometry Seminar University of Wisconsin
November 2018
- **Asymptotic Syzygies for Products of Projective Space**
Fall AMS Central Sectional University of Michigan
October 2018
- **Asymptotic Syzygies in the Semi-Ample Setting (Poster)**
AGNES Poster Session Brown University
September 2018
- **Covering Abelian Varieties and Effective Bertini**
Algebraic Geometry and Number Theory Seminar Rice University
September 2018
- **Syzygies of Surfaces via Distributed Computing**
Algebra Seminar DePaul University
March 2018
- **Asymptotic Syzygies in the Semi-Ample Setting**
Algebra and Algebraic Geometry Seminar University of Wisconsin
February 2018
- **Asymptotic Syzygies in the Semi-Ample Setting (Poster)**
Joint Math Meetings AWM Poster Session San Diego, CA
January 2018
- **Asymptotic Syzygies in the Semi-Ample Setting**
Commutative Algebra Seminar University of Michigan
December 2017
- **Asymptotic Syzygies in the Semi-Ample Setting**
Structures on Free Resolutions Texas Tech University
October 2017
- **A Distributed Numerical Approach to Syzygies of \mathbb{P}^2 (Poster)**
Free Resolutions and Computations UC - Berkeley
July 2017
- **The Degree of $SO(n)$ and Low-rank SDP**
Applied Algebra Seminar University of Wisconsin
March 2017
- **A Probabilistic Approach to Noether Normalization (Poster)**
Lectures on Arithmetic Geometry Rice University
February 2017
- **A Probabilistic Approach to Noether Normalization (Poster)**
Introductory Workshop: Combinatorial Algebraic Geometry Fields Institute
August 2016
- **A Probabilistic Approach to Noether Normalization (Poster)**
Commutative Algebra and Its Interactions with Algebraic Geometry University of Michigan
July 2016
- **A Probabilistic Approach to Noether Normalization (Poster)**
Midwest Commutative Algebra and Algebraic Geometry Conference University of Notre Dame
May 2016

- **Noether Normalization in Families**
Algebraic Geometry Seminar
- **Betti Tables of Graph Curves**
Midwest Algebraic Geometry Graduate Conference
- **Betti Diagrams of Graph Curves**
Algebraic Geometry Seminar

University of Wisconsin
April 2016

University of Illinois - Chicago
April 2015

University of Wisconsin
December 2014

Teaching Experience

- **Math 228: Wisconsin Emerging Scholars**
Instructor
- **Math 221: Calculus and Analytic Geometry I**
Teaching Assistant & Course Coordinator
- **Math 132: Problem Solving in Algebra, Statistics, & Probability**
Instructor
- **Math 221: Calculus and Analytic Geometry I**
Teaching Assistant
- **Math 310: Explorations in Randomness**
Course Assistant
- **Math 490: Introduction to Topology**
Course Assistant
- **Math 351: Principals of Analysis**
Course Assistant
- **Math 105: Data, Functions, and Graphs**
Course Assistant

University of Wisconsin
Fall 2018

University of Wisconsin
Fall 2018

University of Wisconsin
Spring 2015

University of Wisconsin
Fall 2014

University of Michigan
Winter 2014

University of Michigan
Fall 2013

University of Michigan
Winter 2013

University of Michigan
Fall 2012

Conference Organizing

- **GWCAWMMG**
April 12 - April 14, 2019
- **Geometry & Arithmetic of Surfaces**
February 9 - February 10, 2019
- **M2@UW**
April 14-17, 2018
- **Math Careers Beyond Academia**
April 14, 2017

University of Minnesota

University of Wisconsin

University of Wisconsin

University of Wisconsin

Outreach Activities

- **Undergrad Directed Reading Program**
Mentor

University of Wisconsin
January 2018 – Present

- **Graduate Peer Mentoringt**
Mentor University of Wisconsin
September 2018 – December 2018
- **Girls Math Night Out**
Mentor University of Wisconsin
September 2018 – December 2018
- **Madison Math Circle**
Student Volunteer University of Wisconsin
January 2015 – December 2018
- **Madison Math Circle**
Lead Organizer University of Wisconsin
January 2016 – December 2018
- **Out in STEM (oSTEM) @ UW-Madison**
co-Founder University of Wisconsin
July 2017 – Math 2018
- **Out in Math: Professional Issues Facing LGBTQ Mathematicians**
Panelist MAA Panel at the JMM
January 2018
- **Michigan Math Circle**
Organizer University of Michigan
January 2013 – June 2014

Service

- **AMS Graduate Student Blog**
Editor American Mathematical Society
September 2015 – September 2018
- **Committee on Inclusivity and Diversity**
Member UW Dept. of Mathematics
November 2016 – August 2017
- **Committee on TA Pay and Performance**
Member UW Dept. of Mathematics
September 2015 – August 2017
- **Instructor Excellence Program**
Teaching Mentor UW Dept. of Mathematics
September 2015 – May 2016
- **Society of Undergraduate Math Students**
President and Founder University of Michigan
December 2012 – June 2014

Memberships

- **Society of Industrial and Applied Mathematics** January 2017 – Present
- **Association for Women in Mathematics** January 2016 – Present
- **American Mathematical Society** September 2014 – Present