Juliette Bruce, Ph.D.

juliette_bruce1@brown.edu
https://github.com/juliettebruce
www.juliettebruce.xyz
+1 (810) 623-7610

PROFESSIONAL HIGHLIGHTS

My research in mathematics brings together computational, combinatorial, and algebraic tools a to study the geometry of zero loci of systems of polynomials. **I am now excited to apply my mathematical and program to ADD SPECFIC**

- Co-authored 15 research articles that have been, or are submitted, for publication in top peer-reviewed journals.
- Awarded over $300,000 in research grants including the extremely competitive NSF Postdoctoral Research Fellowship.

WORK EXPERIENCE

Postdoctoral Research Associate AUG. 2022 - PRESENT
Brown University

Established myself as a leading early-career researcher, with a strong commitment to mentorship and developing cross-field collaborations.

- Served as a member of the Software Presentation Committee for the International Symposium for Symbolic and Computational Algebra.

NSF Postdoctoral Research Fellow AUG. 2020 – JUL. 2022
University of California, Berkeley

Developed a successful independent research program that brought together ideas from numerous areas of mathematics.

- Mentored several graduate and undergraduate students projects resulting in multiple research articles submitted for publication.

Graduate Assistant AUG. 2014 – JUL. 2020
University of Wisconsin, Madison

Teaching Assistant for 5 semesters and Research Assistant for 7 semesters the Mathematics Department.

- Developed interactive teaching materials on a weekly basis, and oversaw a team of other TA's as a head TA.
- Received the highest departmental and campus-wide awards for teaching: Capstone Teaching Award (2019) and Teaching Assistant Award for Exceptional Service (2018).
- Received the Excellence in Mathematical Research Award (2019) for significant and substantial contributions to research.

PROGRAMMING EXPERIENCE

BEGINNER	HTML/CSS
INTERMEDIATE	Python, Matlab
EXPERT	Macaulay2, Latex

EDUCATION

2014 – 2020	**Ph.D. in Mathematics** University of Wisconsin, Madison
2014 - 2016	**M.A. in Mathematics** University of Wisconsin, Madison
2010 – 2014	**B.S. in Mathematics & Political Science** WITH HIGH HONORS & DISTINCTION University of Michigan

SKILLS

Event Organizing

- Organized 10 research conferences ranging from narrowly focused events with 20 participants to large international conferences with over 100 participants.

Technical & Non-Technical Communication

- Gave over 75 invited research presentations at national and international conferences and seminars, including: Harvard, Princeton, Stanford, UC Berkeley, and UT Austin.
- Gave 25 general audience talks aimed at promoting mathematics to the public.

Leadership

- As lead organizer (2016-2018) for the Madison Math Circle, created new programming and community iniatives that increased attendance from 25 to 250 students per year.
- As the inaugural president (2022) for Spectra, the association for LGBTQ+ mathematicians, and oversaw a fundraiser that raised over $20,000.

SELECT PROJECTS

Computational Algebra Packages for Macaulay2

Developed four peer-reviewed software packages extending the functionality of the open-source computer algebra software Macaulay2. These packages are included (or will be included) with the standard distribution of Macaulay2.

Computing Algebraic Invariants

Led a collaborative research project that brought together tools from numerical linear algebra, high throughput computing, and homological algebra to develop novel approaches to computing algebraic invariants called syzygies.

Foundations of AI/ML in Computer Algebra

An ongoing project to develop robust datasets to allow the development of artificial intelligence/machine learning methods in computational algebraic geometry.

Exploring Trends in News Coverage of Science

Using Python I created and analyzed a database to explore how Quanta covers different areas of science and mathematics by looking at which preprints are cited.

PUBLICATIONS

Freeman, G. R. (1996). Chemistry of Multiply Charged Negative Molecular Ions and Clusters in the Gas Phase: Terrestrial and in Intense Galactic Magnetic Fields. *The Journal of Physical Chemistry*, *100*(11), 4331-4338.

Jacobsen, F. M., Gee, N., **Freeman, G. R.** (1986). Electron mobility in liquid krypton as function of density, temperature, and electric field strength. *Physical Review A*, *34*(3): 2329-2335.