



April 5, 2023

Dear Committee Members,

I am writing to apply for the tenure track professorship in combinatorial algebraic geometry. Currently, I am a National Science Foundation postdoctoral research fellow in the Mathematics Department at the University of California, Berkeley, a position I have held since September 2020. I received my Ph.D. in Mathematics from the University of Wisconsin - Madison in the Summer of 2020 under the guidance of my advisor Professor Daniel Erman. In addition to my position at the University of California, Berkeley, for the 2020-2021 academic year I was a postdoctoral fellow at the Mathematical Sciences Research Institute in Berkeley, CA. Currently, I have accepted a postdoctoral position at Brown University, which is to begin Fall 2021, as part of a National Science Foundation, Focused Research Group in topics relate to combinatorial algebraic geometry.

My research interests lie in algebraic geometry, commutative algebra, and arithmetic geometry. In particular, I am interested in using combinatorial and homological methods to study the geometry of zero loci of systems of polynomials (i.e. algebraic varieties). I am also interested in studying the arithmetic properties of varieties over finite fields. Further, I am passionate about promoting inclusivity, diversity, and justice in the mathematics community. Currently my research focus is on: 1) studying syzygies in algebraic geometry, 2) developing homological algebra over toric varieties, and 3) using tropical geometry to study moduli spaces.

With my application, I include the completed application form, as well as, a curriculum vitae, a publication list, a research statement, a teaching statement, and a list of my teaching experiences. A few highlights in my file are:

- Invited to speak at the *Western Algebraic Geometry Online* (April 2020), *Foundations of Computing in Mathematics* (June 2020), and *LGBTQ+Math* (July 2020).
- Excellence in Mathematical Research Award (2020) - Awarded by the Department of Mathematics at the University of Wisconsin for substantial contributions to research as part of a thesis.
- Co-organizer for seven conferences, two AMS special sessions, and numerous outreach events. Awarded approximately \$55,000 in grants to support these conferences.
- Capstone Teaching Award (2019) - Awarded by the Department of Mathematics at the University of Wisconsin to 1 student recognizing a record of exceptional teaching and service. Teaching Assistant Award for Exceptional Service (2018) - Awarded by the University of Wisconsin to up to 3 teaching assistants campus-wide recognizing their exceptional service.

Please do not hesitate to contact me with any questions, and thank you in advance for your consideration.

Sincerely,

Juliette Bruce