

JAKE KETTINGER

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RESEARCH INTERESTS

My research interests are in Algebraic Geometry. I have researched asymptotic resurgence of symbolic powers of ideals of point configurations with Brian Harbourne and Frank Zimmitti. Right now I am interested in geproci configurations of points in projective space, unexpected varieties, superabundance of varieties, and fields of positive characteristic. I have found new configurations of geproci sets of a kind that does not exist in characteristic 0, and I am applying quasi-elliptic fibrations to the study of geproci sets in characteristic 2.

EDUCATION

University of Nebraska - Lincoln *May 2023*
PhD in Mathematics
Thesis Advisor: Brian Harbourne
Thesis Title: On the superabundance of singular varieties in positive characteristic

University of Nebraska - Lincoln *May 2019*
Masters in Mathematics

University of Wisconsin - Madison *May 2017*
Bachelors in Mathematics

AWARDS

I have been awarded the Linda Bors Fellowship Award in the Fall of 2021. Awarded annually to 3 UNL graduate students based on scholarship.

PAPERS

The geproci property in positive characteristic. *arXiv:2307.04857*, 16 pp.

Extreme values of the resurgence for homogeneous ideals in polynomial rings *with Brian Harbourne and Frank Zimmitti. J. Pure Appl. Algebra* 226 (2022), no. 2, Paper No. 106811, 16 pp.

TEACHING EXPERIENCE: INSTRUCTOR OF RECORD

Math 221/821: Differential Equations *Spring 2023*

Math 106: Calculus I *Fall 2022*

Math 302: Math Modeling (For Pre-Service Teachers) *Fall 2021*

Math 103: College Algebra & Trigonometry *Spring 2021*

Math 203: Contemporary Math *Fall 2020*

Math 107: Calculus II	<i>Summer 2020</i>
Math 102: College Trigonometry	<i>Spring 2020</i>
Math 103: College Algebra & Trigonometry	<i>Fall 2019</i>
Math 104: Applied Calculus	<i>Summer 2019</i>
Math 101: College Algebra	<i>Spring 2019</i>
Math 101: College Algebra	<i>Fall 2018</i>

TEACHING EXPERIENCE: ASSOCIATE CONVENER

Associate Convener and Graduate Teaching Assistant, Math 107: Calculus II	<i>Spring 2022</i>
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The Associate Convener is responsible for coordinating recitation instructors, leading weekly instructor meetings, and organizing the course materials.

TEACHING EXPERIENCE: GRADUATE TEACHING ASSISTANT

Recitation Leader, Math 107: Calculus II	<i>Summer 2018</i>
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Recitation Leader, Math 107: Calculus II	<i>Spring 2018</i>
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Recitation Leader, Math 107: Calculus II	<i>Fall 2017</i>
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I have employed an Active Learning strategy when teaching my recitation sections.

GRADING EXPERIENCE

Math 325: undergraduate analysis	<i>Fall 2021</i>
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Graded weekly problem sets for two sections of undergraduate analysis.

Math 826: graduate analysis	<i>Spring 2021</i>
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Graded weekly problem sets for a Qualifying Exam preparation course.

Math 817: graduate algebra	<i>Fall 2019</i>
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Graded weekly problem sets for a Qualifying Exam preparation course.

SERVICE

AMS Chapter President for the Academic Year Fall 2020 - Spring 2021 at University of Nebraska - Lincoln.

New Student Enrollment for the UNL Math Department in Summers of 2021 and 2022.

I have run a reading course in Algebraic Curves for graduate students at UNL in the 2021-2022 school year.

I have run the Commutative Algebra Reading Seminar at UNL for the 2021-2022 school year.

Each year I volunteer for UNL Math Day, where high school students from across Nebraska visit UNL's campus to participate in math competitions.

Every year I tutor undergraduate students taking calculus and pre-calculus courses at UNL's Math Resource Center.

MENTORING

In Fall 2022, I mentored an undergraduate about elliptic curves in a Directed Reading Program.

In Spring 2020, I mentored an undergraduate about p -adic numbers in a Directed Reading Program, where we met weekly.

TALKS (50 MINUTES)

Enumeration Puzzles in Geometry Commutative Algebra Reading Seminar, University of Nebraska - Lincoln	<i>April 2023</i>
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New Perspectives on Geproci-ness Commutative Algebra Seminar, University of Nebraska - Lincoln	<i>November 2022</i>
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Unexpected Curves Commutative Algebra Reading Seminar, University of Nebraska - Lincoln	<i>March 2022</i>
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The Geometry of Elliptic Fibrations Part 2 Commutative Algebra Reading Seminar, University of Nebraska - Lincoln	<i>November 2021</i>
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The Geometry of Elliptic Fibrations Commutative Algebra Reading Seminar, University of Nebraska - Lincoln	<i>October 2021</i>
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The Geometry of Elliptic Fibrations Graduate Students Talking in Groups, Semigroups, and Topology, University of Nebraska - Lincoln	<i>September 2021</i>
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Exploring the Wonderful World of Divisors Commutative Algebra Reading Seminar, University of Nebraska - Lincoln	<i>March 2021</i>
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Colored Graphical Models and Their Symmetries Graduate Algebraic Geometry Assembly, University of Nebraska - Lincoln	<i>February 2021</i>
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The Internal Language of Toposes Commutative Algebra Reading Seminar, University of Nebraska - Lincoln	<i>November 2020</i>
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Differential Forms and De Rham Cohomology
Graduate Algebraic Geometry Assembly, University of Nebraska - Lincoln

September 2020

Automorphism Groups of Curves and Surfaces
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

March 2020

Triangulated Categories and Derived Functors
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

October 2019

Vector Bundles and Projective Modules
Math Literature Seminar, University of Nebraska - Lincoln

June 2018

COMMUNITY INVOLVEMENT

I have participated in the Collaborative Undergraduate Research Lab in 2017 at UW - Madison. My group did research on the homology of simplicial complexes of graphs.

I have attended every KUMUNU and URiCA (formerly known as KUMUNU Jr.) since 2018.

I planned on attending the PASCA Conference in Barranquilla, Colombia in July 2020, but this was canceled due to COVID.

I planned on attending the Conference on Rings and Polynomials in Graz, Austria in July 2021, but my plans were canceled.

GRADUATE COURSEWORK

Math 817-818: Introduction to Modern Algebra	<i>Fall 2017- Spring 2018</i>
Math 825-826: Mathematical Analysis	<i>Fall 2017 - Spring 2018</i>
Math 871-872: Topology	<i>Fall 2017 - Spring 2018</i>
Math 911: Theory of Groups	<i>Fall 2018</i>
Math 918: Finite-Dimensional Algebras	<i>Fall 2018</i>
Math 901-902: Modern Algebra	<i>Fall 2018 - Spring 2019</i>
Math 918: Commutative Algebra	<i>Spring 2019</i>
Math 990: Hyperbolic Geometry	<i>Spring 2019</i>
Math 918: Lefschetz Properties	<i>Fall 2019</i>
Math 928: Functional Analysis	<i>Fall 2019</i>
Math 856: Differential Topology	<i>Spring 2020</i>
Math 918: Categories of Modules	<i>Spring 2020</i>
Math 924: Theory of Analytic Functions	<i>Fall 2020</i>
Math 918: Multiplicities and Chern Classes	<i>Spring 2021</i>
Math 990: Knot Theory	<i>Spring 2021</i>

