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: The superabunance of singular varieties in positive characteristic
Masters in Mathematics *May 2019*
GPA: 3.988

University of Wisconsin - Madison *May 2017*
Bachelor of 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

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 *Summer 2020*

Math 102: College Trigonometry *Spring 2020*

Math 103: College Algebra & Trigonometry *Fall 2019*

Math 104: Applied Calculus *Summer 2019*

Math 101: College Algebra *Spring 2019*

Math 101: College Algebra *Fall 2018*

TEACHING EXPERIENCE: ASSOCIATE CONVENER

Associate Convener and Graduate Teaching Assistant, Math 107: Calculus II *Spring 2022*

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 *Summer 2018*

Recitation Leader, Math 107: Calculus II *Spring 2018*

Recitation Leader, Math 107: Calculus II *Fall 2017*

I have employed an Active Learning strategy when teaching my recitation sections.

GRADING EXPERIENCE

Math 325: undergraduate analysis *Fall 2021*
Graded weekly problem sets for two sections of undergraduate analysis.

Math 826: graduate analysis *Spring 2021*
Graded weekly problem sets for a Qualifying Exam preparation course.

Math 817: graduate algebra *Fall 2019*
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 *April 2023*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

New Perspectives on Geproci-ness *November 2022*
Commutative Algebra Seminar, University of Nebraska - Lincoln

Unexpected Curves *March 2022*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

The Geometry of Elliptic Fibrations Part 2 *November 2021*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

The Geometry of Elliptic Fibrations *October 2021*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

The Geometry of Elliptic Fibrations *September 2021*
Graduate Students Talking in Groups, Semigroups, and Topology, University of Nebraska - Lincoln

Exploring the Wonderful World of Divisors *March 2021*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

Colored Graphical Models and Their Symmetries *February 2021*
Graduate Algebraic Geometry Assembly, University of Nebraska - Lincoln

The Internal Language of Toposes *November 2020*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

Differential Forms and De Rham Cohomology *September 2020*
Graduate Algebraic Geometry Assembly, University of Nebraska - Lincoln

Automorphism Groups of Curves and Surfaces *March 2020*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

Triangulated Categories and Derived Functors *October 2019*
Commutative Algebra Reading Seminar, University of Nebraska - Lincoln

Vector Bundles and Projective Modules *June 2018*
Math Literature Seminar, University of Nebraska - Lincoln

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	***Fall 2017- Spring 2018***
Math 825-826: Mathematical Analysis	***Fall 2017 - Spring 2018***
Math 871-872: Topology	***Fall 2017 - Spring 2018***
Math 911: Theory of Groups	***Fall 2018***
Math 918: Finite-Dimensional Algebras	***Fall 2018***
Math 901-902: Modern Algebra	***Fall 2018 - Spring 2019***
Math 918: Commutative Algebra	***Spring 2019***
Math 990: Hyperbolic Geometry	***Spring 2019***
Math 918: Lefschetz Properties	***Fall 2019***
Math 928: Functional Analysis	***Fall 2019***
Math 856: Differential Topology	***Spring 2020***
Math 918: Categories of Modules	***Spring 2020***

Math 924: Theory of Analytic Functions *Fall 2020*

Math 918: Multiplicities and Chern Classes *Spring 2021*

Math 990: Knot Theory *Spring 2021*

Math 958: Data Science and Machine Learning *Fall 2021*