



(PETER) YI WEI

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RESEARCH INTERESTS

I work on algebraic geometry and arithmetic geometry. More specifically, I'm interested in

- Geometry of syzygies of algebraic varieties
- Brill-Noether theory of curves
- Moduli theory of curves and K3 surfaces

EMPLOYMENT

University of Arkansas

Visiting Assistant Professor in Mathematics

Fayetteville, Arkansas, USA

August 2025 - now

EDUCATION

University of Wisconsin-Madison

Ph. D. in Mathematics

Thesis: Brill-Noether theory of curves and syzygies of canonical curves

Thesis Advisor: Michael Kemeny

Madison, Wisconsin, USA

September 2019 - June 2025

St Edmund Hall, University of Oxford

Visiting Student Program

Oxford, UK

October 2018- March 2019

University of Chinese Academy of Sciences (UCAS)

B. Sc. in Mathematics

Dissertation: Euler Characteristic of Theta Divisors for Spectral Curves.

Advisor: Baohua Fu

Beijing, CHINA

September 2015 - July 2019

PREPRINT & PUBLICATIONS

- Wei, Peter Yi, *Koszul cohomology and weighted syzygies of algebraic varieties*, in preparation.
- Niu, Wenbo, and **Wei, Peter Yi**, *Syzygies and Mukai's conjecture for symmetric product of curves*, in preparation.
- Kemeny, Michael, and **Wei, Peter Yi**, *The Geometry Syzygy Conjecture in Positive Characteristics*, arXiv:2509.00844.
- Wei, Yi, *Generic Green's Conjecture and Generic Geometric Syzygy Conjecture in Positive Characteristic*, arXiv:2109.12187, to appear in *Journal of Pure and Applied Algebra*
- with Li, A., Yin, X., Xu, B. et al, *Decoding topologically associating domains with ultra-low resolution Hi-C data by graph structural entropy*, *Nature Communications* **9**, 3265 (2018). <https://doi.org/10.1038/s41467-018-05691-7>

AWARDS & GRANTS

Research Assistantship

May - August 2024

UW-Madison

Research Assistantship

May - August 2023

UW-Madison

Exceptional Teaching Award

For demonstrated excellence in teaching over four or more semesters

June 2022

UW-Madison

Henry Schaerf Mathematics Graduate award

November, 2021

	<i>For demonstrated promise in the academic work</i>	UW-Madison
	Research Assistantship	July - August, 2021 UW-Madison, Wisconsin Alumni Research Foundation
	Physical Sciences Award	2019 UW-Madison, Graduate Studies
SELECTED ORGANIZATION	Algebra Learning Seminar	Fall 2025 – Spring 2026
	<i>A weekly meeting series of algebra learning seminar</i>	University of Arkansas, Fayetteville
	Madison Math Circle	Fall 2024
	<i>A weekly series of mathematically based activities aimed at interested middle school and high school students.</i>	UW-Madison
	Directed Reading Program	Fall 2020 - Spring 2021
	<i>Pairing undergraduate students with graduate mentors for semester-long independent studies</i>	UW-Madison
INVITED TALKS	Szyzgies and Mukai's conjecture for symmetric products of curves	March 2026
	<i>AMS Spring Eastern Sectional Meeting</i>	Boston College, Boston, MA
	The Geometric Syzygy Conjecture in Positive Characteristic	March 2026
	<i>AMS Spring Eastern Sectional Meeting</i>	Boston College, Boston, MA
	Szyzgies of canonical curves	September 2025
	<i>Algebra Seminar Fall 2025</i>	University of Arkansas, Fayetteville
	Green's Conjecture on Syzygies of Canonical Curves	August 2023
	<i>Academy of Mathematics and Systems Science Chinese Academy of Sciences, China</i>	
	Geometric Syzygy Conjecture in char p, with reveries from Ogus' result on a versal deformation of K3 surfaces	October 2021
	<i>Algebra and Algebraic Geometry Seminar Fall 2021</i>	UW-Madison
TEACHING EXPERIENCE	Survey of Calculus	Fall 2025, Spring 2026
	<i>Instructor</i>	University of Arkansas, Fayetteville
	Math 221: Calculus and Analytic Geometry I	Spring & Fall 2024, Fall 2022
	<i>Teaching Assistant</i>	UW-Madison
	Math 222: Calculus and Analytic Geometry II	Fall 2023, Fall 2019
	<i>Teaching Assistant</i>	UW-Madison
	Math 320: Linear Algebra and Differential Equations	Spring 2023
	<i>Teaching Assistant</i>	UW-Madison
	Math 319: Techniques in Ordinary Differential Equations	Summer 2022
	<i>Instructor</i>	UW-Madison
	Math 319: Techniques in Ordinary Differential Equations	Spring 2022
	<i>Teaching Assistant</i>	UW-Madison
Math 112: College Algebra	Fall 2021	
<i>Lecturer</i>	UW-Madison	
Math 234: Calculus - Functions of Several Variables	Spring 2021	
<i>Teaching Assistant</i>	UW-Madison	
Math 211: Calculus	Fall 2020, Summer 2020	
<i>Teaching Assistant</i>	UW-Madison	
Math 340: Elementary Matrix and Linear Algebra	Spring 2020	
<i>Teaching Assistant</i>	UW-Madison	