

Alexandra Pevzner

School of Mathematics, University of Minnesota, Twin Cities

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Education

University of Minnesota, Twin Cities

Ph.D. candidate in Mathematics

Advisor: Victor Reiner

2019-present

Expected graduation: Spring 2024

M.S. in Mathematics

Masters/oral exam topic: *Invariant theory of finite groups*

2019-2021

B.S. in Mathematics

with High Distinction

2013-2017

Industry Experience

PeopleNet Communications, Inc.

Technical Operations Engineer, Level 2

2017-19

Conducted long-term technical investigation for problems with on-board computers for commercial vehicles. Searched device logs, data pathways, and source code to diagnose issues with cell, Wi-Fi, messages, and engine data processing. Communicated to customers with varying levels of technical knowledge.

Research Interests

Commutative algebra, with an emphasis on invariant theory and free resolutions.

Papers

Symmetric group fixed quotients of polynomial rings

Journal of Pure and Applied Algebra, Volume 228, Issue 4 (2024)

Preprints under review

Equivariant resolutions over Veronese rings

with Ayah Almousa, Michael Perlman, Victor Reiner, and Keller VandeBogert

Alexander duals of symmetric simplicial complexes and Stanley–Reisner ideals

with Ayah Almousa, Kaitlin Bruegge, Martina Juhnke-Kubitzke, and Uwe Nagel

Invited Research Talks

Upcoming talks

Special Session on Group Actions in Commutative Algebra

JMM San Francisco

Jan 2024

Special Session on Commutative Algebra and its Applications

AMS Eastern Sectional, Howard University

Apr 2024

Past talks

Gender Equity in the Mathematical Study (GEMS) of Commutative Algebra workshop

University of Minnesota, Twin Cities

Nov 2023

Algebra Seminar <i>University of Nebraska, Lincoln</i>	Nov 2023
Special Session on Commutative Algebra, Differential Operators, and Singularities <i>AMS Fall Central Sectional, Creighton University</i>	Oct 2023
Special Session on Combinatorial and Homological Methods in Commutative Algebra <i>AWM Research Symposium, Clark Atlanta University</i>	Sept 2023
Upcoming Researchers in Commutative Algebra (URiCA) conference <i>University of Nebraska, Lincoln</i>	May 2023
Combinatorics Seminar <i>KTH (virtual)</i>	Feb 2023
Combinatorial Algebra meets Algebraic Combinatorics (CAAC) conference <i>University of Waterloo</i>	Jan 2023
Special Session on Topological and Combinatorial Methods in Commutative Algebra <i>JMM Boston</i>	Jan 2023
Algebra and Geometry Seminar <i>Queen's University</i>	Nov 2022
Commutative Algebra Seminar <i>University of Michigan, Ann Arbor (virtual)</i>	Nov 2022
Commutative Algebra and Algebraic Geometry Seminar <i>University of Minnesota, Twin Cities</i>	Oct 2022

Expository talks



Aspects of infinite free resolutions <i>Commutative Algebra and Algebraic Geometry seminar, University of Minnesota</i>	Nov 2023
Introduction to FI modules <i>Student Summer Representation Theory Seminar, University of Minnesota</i>	Aug 2023
Stabilization properties of chains of symmetric ideals <i>Student Combinatorics and Algebra seminar, University of Minnesota</i>	Mar 2022
Invariant theory and fixed quotients of polynomial rings <i>Oral/candidacy exam presentation</i>	Oct 2021
Gorenstein rings in the context of Stanley–Reisner theory ⚡ <i>Topics in Combinatorics course, University of Minnesota</i>	Apr 2021
Invariant rings, Hilbert series, and reflection groups ⚡ <i>Graduate Online Combinatorics Colloquium (GOCC)</i>	Nov 2020
The exchange property of Coxeter groups <i>Reading group on the combinatorics of Coxeter groups</i>	Jul 2020

Workshops and Summer Schools Attended


Macaulay2 Workshop <i>University of Minnesota, Twin Cities</i>	Jun 2023
SLMath/CMND Summer School on Commutative Algebra and Algebraic Geometry <i>University of Notre Dame</i>	May 2023

Workshop on Syzygies and Regularity University of Illinois, Chicago	<i>Apr 2023</i>
WARTHOG: Infinite Dimensional Methods in Commutative Algebra University of Oregon	<i>Jun 2022</i>
D-Modules, Group Actions and Frobenius: Computing on Singularities ICERM (virtual)	<i>Aug 2021</i>
Research Encounters in Algebraic and Combinatorial Topics (REACT) Virtual research workshop	<i>Feb 2021</i>



Organizing

Minnesota Research Workshop in Algebra and Combinatorics 	<i>2023</i>
A weeklong workshop for research and network building among University of Minnesota graduate students, alumni, and current/former postdocs in algebra and combinatorics.	
Directed Reading Program 	<i>2022-23</i>
A semesterly program which pairs undergraduate students with graduate student mentors to explore a mathematical reading together.	
Student Combinatorics and Algebra Seminar	<i>2021-22</i>
A weekly seminar showcasing graduate student talks, along with invited pre-talks for the University of Minnesota Combinatorics Seminar.	

Service and Mentoring

Mathematics Project at Minnesota 	<i>2020-23</i>
<i>A weeklong workshop for underrepresented students interested in pursuing mathematics</i>	
2023: Organized sessions on imposter syndrome, math puzzles, and future career opportunities	
2021: Guided small group of participants through reading and presenting a mathematical article	
2020: One-on-one mentor for participant; still maintain relationship	
Directed Reading Program	<i>2021-23</i>
<i>Reading project mentor</i>	
Spring 2023: <i>Ideals, Varieties, and Algorithms</i> by Cox, Little, O'Shea	
Fall 2021: <i>The Finite Simple Groups</i> by Wilson	
Graduate Student Combinatorics Conference	<i>2021</i>
<i>University of Minnesota, Twin Cities (virtual)</i>	
Session chair for <i>Combinatorics inspired by neural codes</i>	

Software

MatrixFactorizations package for Macaulay2
In-progress, current code available on Github 
Co-authored with David Favero, Timothy Tribone, and Keller VandeBogert
Supplemental functions for InvariantRing package in Macaulay2
Publicly available on Github 

Teaching

University of Minnesota School of Mathematics.....

MATH 1271: Calculus I

Lecturer/Instructor of Record: Fall 2018

Teaching Assistant: Fall 2019, Spring 2023

MATH 2263: Multivariable Calculus

Lecturer/Instructor of Record: Spring 2022

Teaching Assistant: Spring 2020, Fall 2021

MATH 3283W: Sequences, Series, and Foundations (Introduction to Proofs)

Teaching Assistant: Fall 2020, Spring 2021, Fall 2022, Fall 2023

University of Minnesota Talented Youth Mathematics Program (UMTYMP) ☞.....

Calculus III: Multivariable Calculus

Teaching Assistant: Fall 2022

University of Minnesota REU in Combinatorics and Algebra.....

Virtual resolutions of points in $\mathbb{P}^n \times \mathbb{P}^m$ (mentored by Christine Berkesch)

Teaching Assistant: Summer 2023

Students: Isidora Bailly-Hall, Karina Dovgodko, Sean Guan, Sai Sivakumar, Jishi Sun

Invariant theory of cyclic groups (mentored by Victor Reiner)

Teaching Assistant: Summer 2021

Students: Swapnil Garg, Frank Lu, Kevin Ren, Brian Sun

Topology of augmented Bergman complexes (mentored by Victor Reiner)

Teaching Assistant: Summer 2021

Students: Elisabeth Bullock, Aidan Kelley, Kevin Ren, Gahl Shemy, Dawei Shen, Brian Sun, Amy Tao, Joy Zhang

University of Minnesota Office of Undergraduate Education.....

PHYS 1301W: Mechanics

Peer-Assisted Learning (PAL)/ Supplemental Instruction (SI) Facilitator ☞ : Fall 2016

PHYS 1302W: Electricity and Magnetism

PAL/SI Facilitator: Spring 2016, Spring 2017

Awards

AWM Travel Grant	2023
Nomination for SLMath Summer School	2022
University of Minnesota First Year Summer Fellowship	2019
University of Minnesota Professional Development Funding	2019
University of Minnesota Outstanding Graduate in Mathematics	2017

Skills

Software/programming

Macaulay2, SageMath, Mathematica, C++, Python, SQL

Languages

Fluent: English, Russian

Conversational: French

References

Victor Reiner (PhD advisor)
reiner@umn.edu

Christine Berkesch
cberkesch@umn.edu

Bryan Mosher (concerns teaching)
mosher@umn.edu

Uwe Nagel
uwe.nagel@uky.edu

David Wehlau
david.wehlau@queensu.ca