Alexandra Pevzner

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Employment

Zelevinsky Postdoctoral Fellow, Northeastern University *2024-2027*

Education

University of Minnesota, Twin Cities

Ph.D. in Mathematics

Advisor: Victor Reiner *2019-2024*

Thesis: *Symmetric quotients of polynomial rings and Stanley–Reisner rings*

M.S. in Mathematics

Masters/oral exam topic: *Invariant theory of finite groups* *2019-2021*

B.S. in Mathematics

with High Distinction *2013-2017*

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)

Equivariant resolutions over Veronese rings

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

Journal of the London Mathematical Society, Volume 109, Issue 1 (2024)

Preprints under review

Alexander duals of of symmetric simplicial complexes and Stanley–Reisner ideals

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

Invited Research Talks

Special Session on Topics in Commutative Algebra (upcoming)
AMS Spring Central Sectional Meeting, North Dakota State University *April 2026*

Commutative Algebra Seminar
Purdue University *April 2026*

Special Session on Homological and Combinatorial Commutative Algebra
AMS Spring Eastern Sectional Meeting, Boston College *March 2026*

Syzygies and Mirror Symmetry Seminar
Virtual seminar *March 2026*

Special Session on Syzygies and Local Cohomology in Commutative Algebra
AMS Fall Southeastern Sectional Meeting, Tulane University *October 2025*

Special Session on Algebraic Combinatorics and Combinatorial Commutative Algebra
AMS Fall Southeastern Sectional Meeting, Tulane University *October 2025*

Special Session on Algebraic and Enumerative Combinatorics
CMS Summer Meeting, Université Laval *June 2025*

Special Session on Homological Methods in Commutative Algebra
AWM Research Symposium, UW Madison *May 2025*

Special Session on Commutative Algebra and Interactions with Combinatorics
AMS Spring Eastern Sectional, Hartford *April 2025*

Combinatorics Seminar
Brandeis University *Nov 2024*

Geometry, Algebra, Singularities, and Combinatorics Seminar
Northeastern University *Oct 2024*

Geometry, Physics, and Representation Theory Seminar
Northeastern University *Oct 2024*

Combinatorics Seminar
Brown University *Sept 2024*

Special Session on Group Actions in Commutative Algebra
JMM San Francisco *Jan 2024*

Gender Equity in the Mathematical Study (GEMS) of Commutative Algebra workshop
University of Minnesota, Twin Cities *Nov 2023*

Algebra Seminar
University of Nebraska, Lincoln *Nov 2023*

Special Session on Commutative Algebra, Differential Operators, and Singularities
AMS Fall Central Sectional, Creighton University *Oct 2023*

Special Session on Combinatorial and Homological Methods in Commutative Algebra
AWM Research Symposium, Clark Atlanta University *Sept 2023*

Upcoming Researchers in Commutative Algerba (URiCA) conference
University of Nebraska, Lincoln *May 2023*

Combinatorics Seminar
KTH (virtual) *Feb 2023*

Combinatorial Algebra meets Algebraic Combinatorics (CAAC) conference
University of Waterloo *Jan 2023*

Special Session on Topological and Combinatorial Methods in Commutative Algebra
JMM Boston *Jan 2023*

Algebra and Geometry Seminar
Queen's University *Nov 2022*

Commutative Algebra Seminar
University of Michigan, Ann Arbor (virtual) *Nov 2022*

Commutative Algebra and Algebraic Geometry Seminar
University of Minnesota, Twin Cities *Oct 2022*

Expository talks

A tour of Stanley–Reisner theory
AWM Undergraduate Seminar, Northeastern University — *Sept 2025*

When are invariant rings . . . ?
Commutative Algebra Reading Seminar, University of Nebraska — *Nov 2023*

Introduction to FI modules
Student Summer Representation Theory Seminar, University of Minnesota — *Aug 2023*

Stabilization properties of chains of symmetric ideals
Student Combinatorics and Algebra seminar, University of Minnesota — *Mar 2022*

Invariant theory and fixed quotients of polynomial rings
Oral/candidacy exam presentation — *Oct 2021*

Gorenstein rings in the context of Stanley–Reisner theory 🔗
Topics in Combinatorics course, University of Minnesota — *Apr 2021*

Invariant rings, Hilbert series, and reflection groups 🔗
Graduate Online Combinatorics Colloquium (GOCC) — *Nov 2020*

The exchange property of Coxeter groups
Reading group on the combinatorics of Coxeter groups — *Jul 2020*

Workshops and Summer Schools Attended

`Macaulay2` **Workshop**
University of Minnesota, Twin Cities — *Jun 2023*

SLMath/CMND Summer School on Commutative Algebra and Algebraic Geometry
University of Notre Dame — *May 2023*

Workshop on Syzygies and Regularity
University of Illinois, Chicago — *Apr 2023*

WARTHOG: Infinite Dimensional Methods in Commutative Algebra
University of Oregon — *Jun 2022*

D-Modules, Group Actions and Frobenius: Computing on Singularities
ICERM (virtual) — *Aug 2021*

Research Encounters in Algebraic and Combinatorial Topics (REACT)
Virtual research workshop — *Feb 2021*

Organizing

Northeastern University RTG REU
Coordinator — *2026*

Group Actions and Combinatorics in Algebraic Geometry and Commutative Algebra
Special session for AMS Spring 2026 Eastern Sectional Meeting, Boston College; co-organized with Ethan Partida — *2026*

Seminars at Northeastern University
Co-organizer for Geometry, Physics, and Representation Theory (GPRT), and Geometry, Algebra, Singularities, and Combinatorics (GASC) seminars — *2024-26*

Minnesota Research Workshop in Algebra and Combinatorics 🔗 *2023-24*

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 🔗 *2022-23*

A semesterly program which pairs undergraduate students with graduate student mentors to explore a mathematical reading together.

Student Combinatorics and Algebra Seminar *2021-22*

A weekly seminar showcasing graduate student talks, along with invited pre-talks for the University of Minnesota Combinatorics Seminar.

Service and Mentoring

Bridge to Calculus at Northeastern University *2026*

Contributed questions for mock AP exam for Calculus Field Day event

Mathematics Project at Minnesota 🔗 *2020-23*

A weeklong workshop for underrepresented students interested in pursuing mathematics

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 *2021-23*

Reading project mentor

Spring 2023: *Ideals, Varieties, and Algorithms* by Cox, Little, O'Shea
Fall 2021: *The Finite Simple Groups* by Wilson

Graduate Student Combinatorics Conference *2021*

University of Minnesota, Twin Cities (virtual)

Session chair for *Combinatorics inspired by neural codes*

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

Northeastern University

MATH 5112: Algebra 2 (rings and modules; graduate level course)

Spring 2026

MATH 1365: Introduction to Mathematical Reasoning

Fall 2025

University of Minnesota School of Mathematics

MATH 1271: Calculus I

Lecturer/Instructor of Record: Fall 2018, Spring 2024 (online)
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

Jean Roberts Fellowship ($5000 award for research outcomes and service to the department) *2024*

JMM Travel Grant *2023*

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*

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.

Skills

Software/programming

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

Languages

Fluent: English, Russian

Conversational: French