

ARIANA CHIN

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RESEARCH INTERESTS: cluster algebras, algebraic combinatorics

ADVISOR: Pavel Galashin

EDUCATION

University of California, Los Angeles

PhD in Mathematics

Expected June 2027

M.A. in Mathematics

March 2024

Balbes Award - awarded to the top performing female graduate student

2023-2024

Relevant Coursework & Readings:

- Symmetric Functions - Stanley's *Enumerative Combinatorics* (Galashin)
- Bergeron's *Algebraic Combinatorics and Coinvariant Spaces* (Galashin)
- Fomin, Williams and Zelevinsky's *Introduction to Cluster Algebras* (Galashin)
- Computational Combinatorics (Pak)
- Convex Polytopes - Pak's *Lectures on Discrete and Polyhedral Geometry*
- Poset Theory (Pak)
- Groups, rings, Galois theory, modules, category theory, commutative algebra

Teaching Experience (TA):

- Upper Division: Probability and Statistics, Enumerative Combinatorics, Real Analysis
- Lower Division: Discrete Mathematics, Linear Algebra, Multivariable Calculus

University of California, Berkeley

B.A. in Mathematics, B.A. in Computer Science

May 2022

Magna Cum Laude

GPA: 3.96

- Percy Lionel Davis Award - awarded to a senior or seniors who have demonstrated excellent scholarship in mathematics
- Regents' and Chancellor's Scholar

Languages: Python, Java, Scheme, C, JavaScript, RISC-V, Matlab, LaTeX, SQL, MongoDB, DynamoDB

RESEARCH

"Classification of Zamolodchikov periodic cluster algebras" [[pdf](#)][[arXiv: 2510.18031](#)] 2025

- Proved that the Zamolodchikov periodic cluster algebras are in bijection with pairs of commuting (not necessarily reduced or simply-laced) Cartan matrices of finite type
- Classified all such pairs into 29 infinite families and 14 exceptional types in addition to the 6 infinite families and 11 exceptional types in Stembridge's classification
- Showed these pairs are in 1-to-4 correspondence with nonnegative W-cells for products of two dihedral groups, which encode the action of the standard generators on the Kazhdan–Lusztig basis of the associated Iwahori–Hecke algebra

University of Minnesota, Twin Cities - Research Experience for Undergraduates (REU)

2021

Algebra, Combinatorics, Representation Theory

Minneapolis, MN

"F-Polynomial Ratios in the r-Kronecker" [[pdf](#)][[slides](#)]

- Joint with Noah Caplinger, Nyah Davis, and Swapnil Garg

- Explored limiting cluster variables and F-polynomial ratios in the Kronecker cluster algebra
- Presented an alternate proof for the formal power series expansion of the limit in the 2-Kronecker case, and a closed form in the general r-Kronecker case

“Lattice Models and Puzzles for Dual Weak Symmetric Grothendieck Polynomials” [[pdf](#)][[slides](#)]

- Joint with Elisabeth Bullock, Noah Caplinger, Nyah Davis, and Gahl Shemy
- Constructed a lattice model for the dual weak symmetric Grothendieck polynomials, with a negative result for stable symmetric Grothendieck polynomials
- Presented boundary conditions on a lattice model for Littlewood Richardson coefficients for dual weak symmetric Grothendieck polynomials

Ref: <https://www-users.cse.umn.edu/~reiner/REU/REU.html>

Boise State University - Complexity Across Disciplines REU

2019

Number Theory, Quantum Cryptography

Boise, ID

“The Polynomial Learning With Errors Problem and the Smearing Condition” [[paper](#)][[arXiv:2008.04459](#)]

- Joint with Liljana Babinkostova, Aaron Kirtland, Esther Plotnick, and Vladyslav Nazarchuk
- *Journal of Mathematical Cryptology* (JMC), 2022

“The Ring Learning With Errors Problem: Spectral Distortion” [[pdf](#)][[arXiv:2007.13189](#)]

- Joint with Liljana Babinkostova, Aaron Kirtland, Esther Plotnick, and Vladyslav Nazarchuk
- Accepted for publication by *Involve* journal of mathematics as of 7/2022
- Investigated the security of the Learning with Errors (LWE) problem, answering questions regarding smearing and spectral distortion used as conditions for a successful attack
- Presented a smearing-based attack and a closed form for the spectral distortion of cyclotomic polynomials

Institute for Pure and Applied Mathematics - Research in Industrial Projects for Students

2022

Measures and Standards of Fairness in AI Embeddings

Los Angeles, CA

Project Manager

Meta

- Evaluated and generalized metrics of fairness on word embeddings to general embeddings
- Presented a method for mitigating bias in embeddings using factor analysis

CONFERENCES & WORKSHOPS

- Summer School on Algebraic Combinatorics (SSAC) 2025 Seoul, Korea
- Formal Power Series and Algebraic Combinatorics (FPSAC) 2025 Sapporo, Japan
- Formal Power Series and Algebraic Combinatorics (FPSAC) 2024 Bochum, Germany
- Joint Mathematics Meetings (JMM) 2022 - Presenter Seattle, WA
- Graduate Opportunities for Women in Mathematics (GROW) 2021 Chicago, IL
- NCUR 2020 - Presenter Bozeman, MT
- Joint Mathematics Meetings (JMM) 2020 - Presenter Denver, CO
- CUR REU National Symposium 2019 - Nominee/Presenter Alexandria, VA
- Idaho Conference of Undergraduate Research (ICUR) 2019 - Presenter Boise, ID

PROGRAMMING EXPERIENCE

Atlassian - Information Technology - Intelligent Automation - Integration Platforms as a Service (iPaaS)

Backend Software Developer Intern - Integration Engineer

2020

- Integrated Slack, Amazon Lex, and Workato to build an intelligent Slackbot designed to integrate platforms and automate processes within Atlassian
- Used Amazon Lex as an NLU provider to understand human intent and answer user questions, while integrating multiple platforms within chatbot, including Jira, Confluence, Community, and Slack

OTHER INTERESTS

UCLA Women in Mathematics (organizer)	2024-2025
UCLA Symphony, UCLA Philharmonia (violin)	2022-2025
UC Berkeley Symphony Orchestra (violin)	2019-2022
UC Berkeley Chamber Orchestra (violin)	2018-2019