Yulia Alexandr

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Research interests	algebraic statistics, nonlinear algebra, information geometry, convex geometry	
Employment	**University of California, Los Angeles**	Jan 2024–Jun 2026
	Hedrick Assistant Adjunct Professor	
	Mentor: Guido Montúfar	
Education	**University of California, Berkeley**	2019–2023
	PhD in Mathematics	
	Advisors: Bernd Sturmfels and Serkan Hoşten	
	Thesis: *From Voronoi Cells to Algebraic Statistics*	
	Wesleyan University	Class of 2019
	BA in Mathematics with High Honors, class rank: 1	
	Advisor: Karen Collins	
	Thesis: *Combinatorial Nullstellensatz: Various Proofs, Extensions & Applications*	

Awards and fellowships

NSF Graduate Research Fellowship	2020
Chancellor's Graduate Fellowship (UC Berkeley)	2019
Phi Beta Kappa (Connecticut Gamma Chapter)	2019
Rice Prize (Wesleyan University)	2019
awarded to a senior for excellence in mathematics	
Rae Shortt Prize (Wesleyan University)	2018
awarded to a junior for excellence in mathematics	
Twin Cities REU at the University of Minnesota	2018
DIMACS REU at Rutgers University and Charles University (Prague)	2017
Treespace REU at Lehman College	2016

Papers

Maximum information divergence from linear and toric models
with Serkan Hoşten.
Submitted. Available on *arXiv*, 2023.

Moment varieties for mixtures of products
with Joe Kileel and Bernd Sturmfels.
Published in Proceedings of the *International Symposium on Symbolic and Algebraic Computation (ISSAC 2023)*, ACM, New York, 2023, 53–60.

Decomposable context-specific models
with Eliana Duarte and Julian Vill.
Submitted. Available on *arXiv*, 2022.

Logarithmic Voronoi cells for Gaussian models

with Serkan Hoşten.

To appear in *Journal of Symbolic Computation* **122** (2024).

Logarithmic Voronoi polytopes for discrete linear models

Published in *Algebraic Statistics* **15** (2024) no. 1, 1–13.

Logarithmic Voronoi cells

with Alexander Heaton.

Published in *Algebraic Statistics* **12** (2021), no. 1, 75-95.

Computing a logarithmic Voronoi cell

with Alexander Heaton and Sascha Timme.

Published online at *HomotopyContinuation.jl*, 2019.

Recovering conductances of resistor networks in a punctured disk

with Brian Burks, Sunita Chepuri, and Patricia Commins.

Preprint. Available on *arXiv*, 2019.

Deformations of the Weyl character formula for $SO(2n + 1, \mathbb{C})$ **via ice models**

with P. Commins, A. Embry, S. Frank, Y. Li, and A. Vetter.

Preprint. Available on *arXiv*, 2018.

Growth of meandric numbers

with Kayla Cummings and Edgar Jaramillo Rodriguez.

Transcription in *DIMACS-DIMATIA REU booklet (pp. 33-36)*, 2017.

Teaching	**Instructor (UCLA)**	
	PIC 10A: Introduction to Programming	Winter 2024
	Graduate student instructor (UC Berkeley)	
	MATH 10B: Methods of mathematics	Spring 2023
	MATH 54: Linear algebra and differential equations	Fall 2022
	Directed reading program mentor (UC Berkeley)	
	Topics: algebraic combinatorics and graph theory	Spring 2020
	Teaching assistant (Wesleyan University)	
	MATH 231: Probability theory	Fall 2018
	MATH 274: Graph theory	Spring 2018
	MATH 231: Probability theory	Fall 2017

Talks	key: ★=invited/colloquium; †=contributed; △=seminar/lecture.

Moment varieties for mixtures of products
† International Symposium on Symbolic and Algebraic Computation (ISSAC) in Tromsø   July 2023
★ AMS special session on mathematics in data science at Spring Western sectional meeting   May 2023
★ SFSU Algebra, Geometry, and Combinatorics day   March 2023

Computing logarithmic Voronoi cells
★ AMS special session on polynomial systems, homotopy continuation and applications at the JMM   January 2023

Decomposable context-specific models
★ CEG Workshop in Warwick (virtual)   September 2022

Logarithmic Voronoi Cells
★ Naval Postgraduate School in Monterey CA   June 2023
★ Santa Clara University math and CS colloquium   October 2022
△ Discrete Math & Geometry seminar at TU-Berlin (virtual) October 2022
△ SFSU Algebra, Geometry, and Combinatorics Seminar   October 2021
△ Berkeley Combinatorics Research Seminar (virtual)   April 2021
△ Nonlinear Algebra Seminar Online (virtual)   April 2020

Logarithmic Voronoi polytopes
△ Mathematical Methods in Data Analysis in Tirana, Albania   July 2022

Combinatorics of logarithmic Voronoi cells
△ Algebra and Geometry seminar at University of Magdeburg   July 2022

Logarithmic Voronoi cells for Gaussian models
★ SIAM Conference on Applied Algebraic Geometry in Eindhoven   July 2023
† Effective Methods in Algebraic Geometry in Kraków, Poland   June 2022
△ Applied CATS seminar at KTH (virtual)   May 2022

Logarithmic Voronoi polytopes for discrete linear models
† Algebraic Statistics at the University of Hawai'i at Manoa   May 2022
★ AMS Spring Central Sectional Meeting (virtual)   March 2022

Introduction to SAGE
† Mathematical computing virtual workshop by UCB and UBC   Apr 2022

Linear Spaces and Grassmannians
△ Nonlinear Algebra course at MPI MiS (Leipzig, Germany)   June 2019

Caratheodory, Radon, and Helly theorems in convex geometry
△ Minicourse on Convex Geometry at MPI MiS (Leipzig, Germany) July 2021

Ice Models for Types A and B (two talks)
△ Berkeley Combinatorics Reading Seminar   October 2019

Combinatorial Nullstellensatz
Wesleyan University Thesis Defense   January 2019

Visibility Graphs of Staircase Polygons
† Berkeley Undergraduate Number Theory Conference   April 2018

| Visiting positions | **Institute for Mathematical and Statistical Innovation** | Sep–Dec 2013 |
| | Visiting student for *Algebraic Statistics and Our Changing World* | |

Max Planck Institute for Mathematics in the Sciences   2019, 2021, 2022
Summer visitor

Skills

Programming
Macaulay2, SAGE, Mathematica, Singular, C, C++, LaTeX, OCaml, SML, HTML, Python, Julia

Languages
English (native), Russian (native), Hebrew (intermediate)

Service and outreach

Berkeley nonlinear algebra seminar, co-organizer	Fall 2022
STEMinist club, invited speaker, *Berkeley High School*	Nov 2021
Noetherian Ring, member, *UC Berkeley*	2019–present
Math Club graduate school panel, panelist, *Wesleyan University*	2020
Directed reading program (DRP), mentor, *UC Berkeley*	2020
Unbounded Representation (URep), officer, *UC Berkeley*	2019–2020