

Yulia Alexandr

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Email: yulia@math.berkeley.edu

Office: Evans 1045

Research interests algebraic statistics, nonlinear algebra, convex geometry

Education **University of California, Berkeley** 2019–present
PhD in Mathematics
Advisors: Bernd Sturmfels and Serkan Hoşten
Tentative thesis title: *Logarithmic Voronoi cells*

Wesleyan University Class of 2019
BA in Mathematics with High Honors
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
<i>awarded to a senior for excellence in mathematics</i>	
Rae Shortt Prize (Wesleyan University)	2018
<i>awarded to a junior for excellence in mathematics</i>	
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 **Decomposable context-specific models**
with Eliana Duarte and Julian Vill.
Submitted. Available on [arXiv](#), 2022.

Logarithmic Voronoi cells for Gaussian models
with Serkan Hoşten.
Presented at MEGA 2022 in Kraków, submitted. Available on [arXiv](#), 2022.

Logarithmic Voronoi polytopes for discrete linear models
Submitted. Available on [arXiv](#), 2021.

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.

REU project. 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.

REU project. 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

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; Δ=seminar/lecture.

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

★ Santa Clara University math and CS colloquium

October 2022

Δ Discrete Math & Geometry seminar at TU-Berlin (virtual)

October 2022

Δ SFSU Algebra, Geometry, and Combinatorics Seminar

October 2021

Δ Berkeley Combinatorics Research Seminar (virtual)

April 2021

Δ 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

† 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

Skills

Programming

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

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*
Unbounded Representation (URep), officer, *UC Berkeley*

2020
2019–2020