Yulia Alexandr

University of California, Berkeley
826 Evans Hall
✉ *yulia@math.berkeley.edu*

Research Interests

combinatorics, nonlinear algebra, commutative algebra, graph theory

Education

2019– **University of California, Berkeley**, *Ph.D. in Mathematics.*

Class of 2019 **Wesleyan University**, *B.A. in Mathematics (High Honors).*
Honors Thesis: "Combinatorial Nullstellensatz: Various Proofs, Extensions and Applications"
Advised by Karen L. Collins

Academic & Research Experience

Jun–Jul 2019 **Max Planck Institute for Mathematics in the Sciences**, *Visitor.*
Leipzig, Germany
Supervised by Bernd Sturmfels
Project: *Logarithmic Voronoi Diagrams* (ongoing collaboration with Alexander Heaton)

Jun–Aug 2018 **Twin Cities REU**, *NSF Student Researcher.*
University of Minnesota, MN
Supervised by Benjamin Brubaker and Pavlo Pylyavskyy
Projects: *Ice Models and Classical Groups* and *Resistor Networks in a Punctured Disk*

May–Aug 2017 **DIMACS/DIMATIA REU**, *NSF Student Researcher.*
Rutgers University, NJ and Charles University, the Czech Republic
Supervised by James Abello
Project: *Visibility Graphs of Staircase Polygons*

Sep 2016–Feb 2017 **Treespace REU**, *NSF Student Researcher.*
Lehman College (CUNY), NY
Mentored by Katherine St. John and Megan Owen
Project: *Recovering the Closure of Rooted Triples*

Teaching

Fall 2018 **Probability Theory**, *Teaching Assistant.*
Instructor: Han Li (Wesleyan University)

Spring 2018 **Graph Theory**, *Teaching Assistant.*
Instructor: Karen L. Collins (Wesleyan University)

Fall 2017 **Probability Theory**, *Teaching Assistant.*
Instructor: Felipe Ramírez (Wesleyan University)

Talks & Lectures

Oct 2019 *Ice Models for Type A* (two talks)
Berkeley Combinatorics Reading Seminar

Jun 2019 *Linear Spaces and Grassmannians*
Max Planck Institute for Mathematics in the Sciences (Leipzig, Germany)

Jan 2019 *Combinatorial Nullstellensatz: Various Proofs, Extensions and Applications*
Wesleyan University Thesis Defense

Apr 2018 *Visibility Graphs of Staircase Polygons*
Berkeley Undergraduate Number Theory Conference

Awards & Fellowships

2020 NSF Graduate Research Fellowship

2019 Chancellor's Graduate Fellowship (UC Berkeley)

Phi Beta Kappa (Connecticut Gamma Chapter)

Rice Prize (Wesleyan University)
awarded to a senior for excellence in mathematics

2018 Rae Shortt Prize (Wesleyan University)
awarded to a junior for excellence in mathematics

Workshops & Conferences Attended

2019 Workshop on Classical and Quantum Integrable Systems at Euler International Mathematical Institute in Saint Petersburg, Russia;

Summer School on Randomness and Learning in Non-Linear Algebra at MPI Leipzig;

Workshop on Applied Algebra at TU Braunschweig, Germany;

Discrete Math Day at U Mass, Amherst;

2017 GROW Conference at Northwestern University;

WIMIN (Women in Math) at Smith College;

DIMATIA Program at Charles University, the Czech Republic;

Midsummer Combinatorial Workshop at Charles University, the Czech Republic;

SAMSI Optimization Workshop.

Languages

Programming C++, LaTeX, OCaml, SML, HTML, Python

Spoken Russian (native), English (fluent), Hebrew (beginner)

Publications and Preprints

[1] with Alex Heaton and Sascha Timme. *Computing a Logarithmic Voronoi Cell.* Published on the HomotopyContinuation.jl website, 2019.

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[2] with Brian Burks, Sunita Chepuri, and Patricia Commins. *Recovering Conductances of Resistor Networks in a Punctured Disk.* Submitted, 2019. arXiv: 1812.01517

[3] with Patricia Commins, Alexandra Embry, Sylvia Frank, Yutong Li, and Alexander Vetter. *Deformations of the Weyl Character Formula for $SO(2n+1, \mathbb{C})$ via Ice Models.* In preparation, 2018. arXiv: 1811.11879

[4] with Kayla Cummings and Edgar Jaramillo Rodriguez. *Growth of Meandric Numbers.* Transcription in DIMACS-DIMATIA REU booklet (pp. 33-36), 2017.