Yulia Alexandr

University of California, Berkeley
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Research Interests

combinatorics, nonlinear algebra, algebraic statistics

Education

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

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

Research Experience

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

Summer 2018 **Twin Cities REU**.
Supervised by Benjamin Brubaker and Pavlo Pylyavskyy (University of Minnesota)
Projects: *Ice Models fo type B* and *Resistor Networks in a Punctured Disk*

Summer 2017 **DIMACS/DIMATIA REU**.
Supervised by James Abello (Rutgers University and Charles University, Czechia)
Project: *Visibility Graphs of Staircase Polygons*

Fall 2016 – Winter 2017 **Treespace REU**.
Mentored by Katherine St. John and Megan Owen (CUNY Lehman College)
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

Apr 2020 *Logarithmic Voronoi Cells*
Nonlinear Algebra Seminar Online

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

2020 Nonlinear Algebra Seminar Online

2019 Workshop on Classical and Quantum Integrable Systems (St. Petersburg, Russia)

Summer School on Randomness and Learning in Nonlinear Algebra (MPI MiS)

Workshop on Applied Algebra (TU Braunschweig, Germany)

Discrete Math Day (U Mass Amherst)

2017 Graduate Opportunities for Women (Northwestern University)

Women in Math (Smith College)

Midsummer Combinatorial Workshop (Charles University, Czechia)

SAMSI Optimization Workshop

Languages

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

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

Service

2019– Unbounded Representation (URep), *UC Berkeley*

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.