Curriculum Vitae
Greta C. Panova

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Employment

2023 – 2026	**Gabilan Distinguished Professor of Science and Engineering**, University of Southern California, Los Angeles, CA.
2022 –	**Professor**, Mathematics, University of Southern California, Los Angeles, CA.
2018 – 2022	**Associate Professor**, Mathematics, University of Southern California, Los Angeles, CA.
2018	**Associate Professor**, University of Pennsylvania, Philadelphia, PA.
2017 – 2018	**Von Neumann Fellow**, Institute for Advanced Studies, Princeton, NJ.
2014 – 2018	**Assistant Professor**, University of Pennsylvania, Philadelphia, PA.
2011 – 2014	**Simons Postdoctoral Fellow/Assistant Adjunct Professor**, University of California Los Angeles

Education

2006 – 2011	**Ph.D in Mathematics**, Harvard University.
2005 – 2006	**M.A. in Mathematics**, University of California, Berkeley.
2001 – 2005	**B.S. in Mathematics**, Massachusetts Institute of Technology.
2001 – 2005	**B.S. in Electrical Science and Engineering**, Massachusetts Institute of Technology.

Research interests

Algebraic and enumerative Combinatorics with applications and relation to Computational Complexity theory, Probability and Statistical Mechanics. Modeling in Molecular Biology.

Honors and Awards

2023–2026	**National Science Foundation** Award CCF:AF 2302174.
2020–2023	**National Science Foundation** Award CCF:AF 2007652.
2020	**The IMI mathematics award** of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, awarded to Bulgarian citizen under the age of 40 once every 3 years for high achievements in mathematics.
2018 – 2021	**National Science Foundation** Award DMS 1800423.
2017 – 2018	**von Neumann Fellowship**, IAS, Princeton.
2015 – 2018	**National Science Foundation** Award DMS 1500834.
2015	**AWM** travel grant award for Joint EMS–PMS meeting and FPSAC'15.
2015 – 2020	**Simons Collaboration Grant** award (declined due to NSF support).
2011 – 2014	**Simons Postdoctoral Fellowship** (UCLA, Simons Foundation)
2011	**Best Student Paper Award** (23rd Formal Power Series and Algebraic Combinatorics conference, Iceland)

2011	**European Post-Doctoral Institute** fellowship, awarded by IHÉS (Paris, France). (declined)
2006 – 2011	**Putnam Fellowship** (Harvard Department of Mathematics)
2006 – 2009	**James Mills Peirce Fellowship** (Harvard University), (awarded to the top three admitted graduate students in a program)
2005 – 2006	**Katz Fellowship** of the College of Letters and Science (University of California, Berkeley)
2005	**Phi Beta Kappa** member (awarded by the MIT chapter)
2001	**Third Prize** at the William Lowell Putnam Mathematics Competition, rank 19.
1999 – 2001	**One gold** and **two silver medals** at the International Mathematics Olympiads (in USA, South Korea, Romania)

Visiting positions and scholarships

2024, Spring	**Visiting Researcher and program coorganizer**, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, CA. *Geometry, Statistical Mechanics and Integrability* Program.
2021, Fall	**Research Professor**, Mathematical Sciences Research Institute, Berkeley, CA. *Universality and Integrability in Random Matrix Theory and Interacting Particle Systems* Program.
2020, Spring	**Invited Member**, Institute Mittag-Leffler, Sweden. *Algebraic and Enumerative Combinatorics* Program.
2020, Feb	**Simons Visiting Professor** of the Mathematisches Forschungsinstitut Oberwolfach, at University of Hannover, Germany.
2018 Fall	**Visiting Scholar**, Simons Institute for the Theory of Computing (part-time, unpaid). *Lower bounds in computational complexity* Program.
2017, Oct	**Visiting Scholar**, Erwin Schrödinger Institute, Vienna, Austria. *Algorithmic and Enumerative combinatorics* Program.
2017 Winter	**Visiting Associate Professor**, Institute Henry Poincare, Paris, France. *Combinatorics and Interactions* Program.
2016, Mar	**Visiting Scholar**, Kavli Institute for Theoretical Physics, Santa Barbara, CA. *New approaches to non-equilibrium and random systems: KPZ integrability, universality, applications and experiments* Program.
2015, May–Jun	**Visiting Scholar**, Galileo Galilei Institute for Theoretical Physics, Florence, Italy. *Statistical mechanics* Program.
2013, Aug-Sep	**Research Consultant** at Microsoft Research Theory Group, Redmond, WA.
2012 Spring	**Post-doctoral fellow**, MSRI, University of California Berkeley. *Random Spatial Processes* Program.

Publications and Preprints

Preprints

1. *Diffusion of activated ATM explains γH2AX and MDC1 spread beyond the DNA damage site* (G. Danovski, G. Panova, B. Keister, K. Blagoev, G. Georgiev, T. Dyankova, S. Stoynov (PI)), `bioRxiv, 2023.10. 02.560532`.
2. *Computational complexity in algebraic combinatorics*, G. Panova, Current Developments in Mathematics, Int. Press, to appear. `arXiv:2306.17511 2`.

3. *On the cross-product conjecture for the number of linear extensions* (with S. H. Chan, I. Pak), `arXiv:2306.09240`.
4. *Complexity and asymptotics of structure constants*, G. Panova, Proceedings of Open Problems in Algebraic Combinatorics 2022, to appear, `arXiv:2305.02553`
5. *All Kronecker coefficients are reduced Kronecker coefficients*, (with C. Ikenmeyer), submitted, `arXiv:2305.03003`.
6. *The Newton Polytope of the Kronecker product*, (with. Chenchen Zhao), submitted (2023).

Published / Accepted

7. *Positivity of the symmetric group characters is as hard as the polynomial time hierarchy* (with C. Ikenmeyer, I. Pak), Int. Math. Res. Notices, to appear (2023).
8. *Minimal skew semistandard Young Tableaux and the Hillman-Grassl correspondence* (with A. H. Morales, G. Y. Park), Séminaire Lotharingien de Combinatoire **89B** (2023) #55, 12 pp.

   Durfee squares, symmetric partitions and bounds on Kronecker coefficients (with I. Pak), Journal of Algebra**629** (2023), 358–380.
9. *Effective poset inequalities* (with S. H. Chan, I. Pak), SIAM Journal on Discrete Mathematics **37** (3) (2023), 1842–1880.
10. *Extensions of the Kahn–Saks inequality for posets of width two* (with S. H. Chan, I. Pak), Combin. Theory **3**(1) #8 (2023).

    Proc. 34th SODA, SIAM, 2023.
11. *Chromatic symmetric functions of Dyck paths and q-rook theory* (with L. Colmenarejo, A. H. Morales), European J. Combin. **107** (2023), 103595.

    Extended abstract in Sém. Loth. de Combinatoire, FPSAC Proceedings, 85B.65 (2021).
12. *The cross-product conjecture for width two posets* (with S. H. Chan, I. Pak), Trans. Amer. Math. Soc **375** (2022), pp. 5923–5961 `10.1090/tran/8679`.
13. *Log-concavity in planar random walks* (with S. H. Chan, I. Pak), Combinatorica (2022), `10.1007/s00493-021-4860-7`.
14. *Hook formulas for skew shapes IV. Increasing tableaux and factorial Grothendieck polynomials* (with A.H. Morales, I. Pak), J. Math. Sci. **261**, pp. 630–657 (2022) `10.1007/s10958-022-05777-0`.
15. *Sorting probabilities for Young diagrams* (with S.H.Chan, I.Pak), Discrete Anal. (2021), No. 24, 57 pp,`10.19086/da.30071`
16. *Sorting Probabilities for Catalan posets* (with S.H.Cahn, I. Pak), Adv. Appl. Math. **129** (2021), `doi.org/10.1016/j.aam.2021.102221`.
17. *Breaking down the reduced Kronecker coefficients* (with I. Pak), Compt. Rend. Math. **358** (2020) no. 4, pp. 463–468.
18. *Upper bounds on Kronecker coefficients with few rows* (with I. Pak), Linear Alg. and Its Applications **602** (2020) pp.157–178.
19. *Counting partitions inside a rectangle* (with S. Melczer, R. Pemantle), SIAM J. Discrete Math. **34**(4), 2388–2410. Extended abstract at FPSAC 2019.
20. *On geometric complexity theory: Multiplicity obstructions are stronger than occurrence obstructions* (with J. Dörfler, C. Ikenmeyer), SIAM J. Appl. Algebra Geometry, **4**(2), pp. 354–376.

46th Int. Col. on Automata, Languages, and Programming (ICALP) 2019, 10.4230/LIPIcs.ICALP.2019.51.

21. *Bounds on the largest Kronecker and induced multiplicities of finite groups* (with I. Pak, D. Yeliussizov), Comm. Algebra (April 2019), 10.1080/00927872.2018.1555837.
22. *On the largest Kronecker and Littlewood–Richardson coefficients* (with I. Pak, D. Yeliussizov), J. Comb. Theory Ser. A, **165** (2019), pp. 44–77 10.1016/j.jcta.2019.01.008
23. *No occurrence obstructions in geometric complexity theory* (with P. Bürgisser, C.Ikenmeyer), J. Amer. Math. Soc. **32** (2019), 163-193 10.1090/jams/908.

    Proceedings 57th Annual IEEE Symposium on Foundations of Computer Science (FOCS), 386–395, 2016.
24. *Hook formulas for skew shapes III. Multivariate and product formulas*(with A.Morales, I.Pak), Alg. Comb. **2** (2019), no. 5, pp. 815–861 .

    Extend abstract: Proc. of FPSAC 2018, *Discrete Math. Theor. Comput. Sci. Proc.*
25. *LLT polynomials, chromatic quasisymmetric functions and graphs with cycles* (with P. Alexandersson), Disc. Math, **341**(12) (2018), pp. 3453–3482.
26. *Asymptotics of principal evaluations of Schubert polynomials for layered permutations*(with A. Morales, I. Pak), Proc. Amer. Math. Soc, 10.1090/proc/14369 (2018).
27. *Coordination of Repair of Complex DNA Lesions.* (R. Aleksandrov, A. Dothchev, D. Krastev, A. Vladimirova, G. Georgiev, G. Panova, Y. Babucov, G. Danovski, T. Dyankova, A. Atemin, M. Nedelcheva-Veleva, M. Sarov, F. Buchholz, A. Hyman, S. Grill, S. Stoynov), Mol. Cell **69**(6) (2018), 10.1016/j.molcel.2018.02.016.
28. *A minimaj-preserving crystal on ordered multiset partitions* (with G. Benkart, L. Colmenarejo, P. E. Harris, R. Orellana, A. Schilling, M. Yip). Adv. Appl. Math. **98** (2018), pp 96–115.

    Extend abstract: Proc. of FPSAC 2018, *Discrete Math. Theor. Comput. Sci. Proc.*
29. *Why is* $\pi < 2\phi$ *?* (with A. Morales, I. Pak), Amer. Math. Monthly **125** (2018), Issue 8. 10.1080/00029890.2018.1496757.
30. *External powers of tensor products as representations of general linear groups* (with P. Śniady), Alg. Comb. **1**(2018), no. 1, pp 81–94.
31. *Geometric complexity theory and matrix powering* (with F. Gesmundo, C. Ikenmeyer) Diff. Geom. and Its Applications **55**(2017), pp 106–127.
32. *Asymptotics of the number of Standard Young Tableaux of skew shape* (with A. Morales, I.Pak), Europ. J. Comb. **70**(2018), pp. 26–49.
33. *Hook formulas for skew shapes II: combinatorial proofs and enumerative applications*(with A. Morales, I. Pak), SIAM J. Discrete Math. **31** (2017), no. 3, pp.1953–1989.
34. *Rectangular Kronecker coefficients and plethysms in geometric complexity theory* (with C. Ikenmeyer), Adv. Math. **319** (2017), pp. 40–66.

    Proceedings 57th Annual IEEE Symposium on Foundations of Computer Science (FOCS), 395–405, 2016.

35. *Hook formulas for skew shapes I: q-analogues and bijections* (with A. Morales, I. Pak), J. Combin. Theory Ser. A, **154** (2018), pp. 350–405.

    Extend abstract: Proc. of FPSAC 2016, *Discrete Math. Theor. Comput. Sci. Proc.*

36. *Lozenge tilings with free boundaries* (2014), Lett. Math. Phys., (2015), **105**(11), pp. 1551–1586.

    Extended abstract: Proc. of FPSAC 2015, *Discrete Math. Theor. Comput. Sci. Proc.*

37. *Bounds on the Kronecker and q–binomial coefficients* (with I. Pak),J. Combin. Theory Ser. A, **147**, (2017), pp. 1–17.

38. *On the complexity of computing Kronecker coefficients* (with I.Pak), Comput. Complexity, **26**(2017), no. 1, pp.1–36.

39. *Pfaffian formulas for spanning tree probabilities* (with D.B.Wilson), Combin. Probab. Comput. **26** (2017), no. 1, 118–137.

40. *Strict unimodality of q-binomial coefficients* (with I.Pak), C. R. Math. Acad. Sci. Paris **351**(2013), no. 11-12, pp.415–418.

41. *The Thermodynamic Patterns of Eukaryotic Genes Suggest a Mechanism for Intron–Exon Recognition* (M. Nedelcheva-Veleva , M. Sarov , I. Yanakiev , E. Mihailovska , M. Ivanov , G. Panova, S. Stoynov[PI]), Nature Communications **4** (2013), `doi:10.1038/ncomms3101`.

42. *Unimodality via Kronecker products* (with I.Pak), J. Algebraic Combin. **40**(2014), no. 4, pp.1103–1120.

43. *Kronecker products, characters, partitions, and the tensor square conjectures* (with I.Pak, E.Vallejo), Adv. Math. **288** (2016), pp. 702–731.

    Extended abstract in DMTCS Proceedings, FPSAC 2014.

44. *Asymptotics of symmetric polynomials with applications to statistical mechanics and representation theory*(with V.Gorin), Ann. Probab. (2015), **43**(6), pp. 3052 – 3132.

    Extended abstract in DMTCS Proceedings of FPSAC 2013.

45. *Schur times Schubert via the Fomin-Kirillov algebra* (with K.Meszaros, A.Postnikov), Electron. J. Combin. **21**(2014), no. 1, Paper 1.39, 22 pp.

46. *Dyck tilings, linear extensions, inversions and descents*(with J.S.Kim, K.Meszaros, D.B.Wilson), J. Combin. Theory Ser. A (2014), **122**:9–27.

    Exteded abstract in DMTCS Proceedings of FPSAC 2012.

47. *Tableaux and plane partitions of truncated shapes*(2010), Adv. in Appl. Math., **49**, Issues 3–5, (2012), pp.196–217.

    Extended abstract in DMTCS Proceedings of FPSAC 2011 (*Best student paper* award).

48. *Invertible matrices with restricted patterns and q-analogues of permutations* (with J.Lewis, R.Liu, A.Morales, S.Sam, Y.Zhang) (2010), J. Comb. 2 (2011), no. 3, pp.355–395. Extended abstract in DMTSC Proceedings of FPSAC 2011.

49. *Separable permutations and Greene's theorem* (with A.Crites, G.Warrington)(2010), Ars Combin. **128**(2016), pp.103–116.

50. *Factorization of banded permutations*, Proc. Amer. Math. Soc. **140** (2012), pp.3805–3812.

51. *Bijective enumeration of permutations starting with a longest increasing subsequence*, 22nd International Conference on Formal Power Series and Algebraic Combinatorics Proceedings, Discrete Math. Theor. Comp. Sci. Proc. (2010), pp. 973–982.

52. *Polynomiality of some hook-length statistics* (formerly *Proof of a conjecture of Okada*)(2008), Ramanujan J. (2012) **27**, pp.349–356.

Talks and presentations

Plenary talks

2023 Apr **Current Developments in Mathematics** conference, Harvard University, Cambridge, MA. (upcoming)
2022 Nov **Pacific North-West Integrable Probability Conference**, Corvallis, OR. (upcoming)
2022 Jul **Algorithmic and Algebraic Combinatorics** conference, Vienna, Austria.
2022 May **Open problems in Alebraic Combinatorics**, University of Minnesota.
2021 Jul **National Colloquium**, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences.
2019 May **Southern California Discrete Math Symposium**, Claremont McKenna College, CA.
2018 Feb **Algebraic and Enumerative Combinatorics** conference, Okayama, Japan.
2017 Jul **Formal Power Series and Algebraic Combinatorics**, London, UK.
2017 May **Midwest Combinatorics Conference**, Minneapolis, MN.
2016 Feb **Triangle Lectures in Combinatorics**, Greensboro, NC.

Invited lecture series and minicourses

2023 Aug **Algebraic and Asymptotic Combinatorics Summer School**, Institute of Mathematics at the Polish Academy of Sciences, 5 minicourse lectures (Bedlewo, Poland).
2023 Jul **DIMERS** closing conference, 2 minicourse lectures (Paris, France)(upcoming)
2021 Nov **School on Geometric Complexity Theory** gct2022, one lecture, Chennai, India. (online)
2020 Jul **Integrable Probability Summer School**, Clay Mathematics Institute - Heilbronn Institute for Mathematical Research, 3 minicourse lectures, online/(Cambridge, UK)
2019 Feb **Graduate Student Meeting on Applied Algebra and Combinatorics**, Max Planck Institute for Mathematics in the Sciences, 2 minicourse lectures (Leipzig, Germany)

Invited conference and seminar talks

2023 Aug **Important Papers in Algebraic Combinatorics** seminar, virtual.
2023 Jul **Formal Power Series and Algebraic Combinatorics** conference, Davis, CA.
2023 Jul **Mathematics Days in Sofia** conference, Bulgaria.
2023 May **AMS Meeting**, Fresno, CA.
2023 Mar **Mathematics Colloquium**, UC Berkeley, CA.
2023 Feb **Guest Speaker Series**, CCR, La Jolla, CA.
2023 Jan **Special Colloquium**, University of Toronto, Canada.
2023 Jan **Special Colloquium**, Georgia Institute of Technology, Atlanta, GA.
2022 Dec **Enumerative Combinatorics** workshop, Mathematisches Forschungsinstitut Oberwolfach, Germany.

2022 Dec **Representation Theory and Applications** session at PRIMA congress, Vancouver, Canada.
2022 Oct **Interactions between Hessenberg Varieties, Chromatic Functions, and LLT Polynomials** workshop, BIRS, Banff, Canada.
2022 Sep **Complexity and Geometry in Computation** conference, University of Konstanz, Germany.
2022 Sep **International Conference on Enumerative Combinatorics and Applications**, online.
2022 Jun **Heilbronn Meeting on Permutation Patterns**, Lancaster University, United Kingdom.
2022 May **Combinatorial and Algebraic Enumeration**, Goulden-Jackson birthday conference, University of Waterloo, Canada.
2022 Apr **UCSC Mathematics Colloquium**, Santa Cruz, CA.
2022 Mar **Rutgers Experimental Math** seminar, Rutgers University, New Brunswick, NJ.
2022 Mar **Brandeis Combinatorics** seminar, Brandeis University, Boston, MA.
2021 Dec **Optimization under symmetry** workshop, Simons Institute, Berkeley, CA.
2021 Nov **Member seminar**, MSRI, Berkeley, CA.
2021 Oct **Davis Probability Seminar**, UC Davis, CA.
2021 Oct **MSU Combinatorics Seminar**, Michigan State University, MI. (online)
2021 Oct **Berkeley Combinatorics Seminar**, UC Berkeley, Ca.
2021 Jul **Algebra and Logic Seminar**, Institute of Mathematics and Informatics at BAS, Sofia, Bulgaria. (online)
2021 May **New Methods in Analytic Combinatorics** minisymposium, CanaDAM 2021. (online)
2020 Nov **IMSc Algebraic Combinatorics** seminar, Institute for Mathematical Sciences, Chennai, India. (online)
2020 Nov **Mathematics Colloquium** at University of Illinois Urbana-Champaign, Urbana, IL. (online)
2020 Mar **Unimodality, Log-concavity and beyond** workshop, Mittag Leffler Institute, Stockholm, Sweden.
2020 Feb **Kronecker, Plethysm, and Sylow Branching Coefficients and their applications to Complexity Theory** workshop, Mathematics Forschungsinstitut Oberwolfach, Germany.
2020 Feb **University of Hannover Algebra** seminar, Hannover, Germany.
2020 Jan **UCSD Computer Science Theory** seminar, San Diego, CA.
2020 Jan **Joint Mathematics Meetings**, Sepcial Session on Combinatorial Structures and Integrable Systems, Denver, CO.
2019 Oct **UC Davis Combinatorics Seminar**, Davis, CA.
2019 Sep **Discrete Geometry and Algebraic Combinatorics** conference, South Padre Island, TX.
2019 May **Enumerative Combinatorics** minisymposium at the 7th Canadian Discrete and Algorithmic Mathematics Conference, Vancouver, Canada.
2019 Apr **Combinatorics Seminar**, USC, Los Angeles, CA.
2019 Mar **WiSE Research Horizons Symposium**, USC, Los Angeles, CA.
2019 Mar **Asymptotic Algebraic Combinatorics** worshop, BIRS, Banff, Canada.
2019 Jan **Representation theory connections to (q,t)-Combinatorics** workshop, BIRS, Banff, Canada.

2018 Dec **Algebraic Methods** workshop (in "Lower bounds in computational complexity"), Simons Institute, Berkeley, CA.
2018 Jun **Exactly Solvable Quantum Chains** workshop, IIP–UFRN, Natal, Brazil.
2018 May **Enumerative Combinatorics** workshop, Mathematisches Forschungsinstitut Oberwolfach, Germany.
2018 Apr **Combinatorial Representation Theory** Special Session, Spring Eastern AMS Meeting, Boston, MA.
2018 Mar **Cornell Combinatorics Seminar**, Ithaca, NY.
2018 Mar **Mathematics Colloquium**, University of California Berkeley.
2018 Feb **Algebraic and Enumerative Combinatorics in Okayama** conference, Okayama, Japan.
2018 Jan **Special Colloquium**, University of Southern California, Los Angeles, CA.
2018 Jan **Special Colloquium**, University of Washington, Seattle, WA.
2018 Jan **Special Colloquium**, Institute for Science and Technology, Vienna, Austria.
2017 Dec **Geometric R-Matrices in Combinatorics and Probability** workshop, MATRIX Institute, Unviersity of Melbourne, Australia.
2017 Dec **Members Seminar**, Institute for Advanced Study, Princeton, NJ.
2017 Nov **Computer Science and Discrete Math** Seminar, Institute for Advanced Study, Princeton, NJ.
2017 Nov **Discrete Mathematics Seminar**, Princeton University, Princeton, NJ.
2017 Nov **Discrete Mathematics Seminar**, Rutgers University, New Brunswick, NJ.
2017 Nov **Algebra–Number Theory seminar**, University of Maryland, College Park, MD.
2017 Oct **Enumerative Combinatorics** Workshop, Erwinn Schroedinger Institute, Vienna, Austria.
2017 Sep **Integrability across mathematics and physics**, Berkeley, CA.
2017 May **Algebraic Combinatorixx** workshop, BIRS, Banff, Canada.
2017 Apr **Combinatorics Seminar**, KTH Royal Institute of Technology, Stockholm, Sweden.
2017 Mar **Seminaire Lotharingien de Combinatoire**, Ottrott/Strasbourg, France.
2017 Feb **Asymptotic Representation Theory** workshop, Institute Henri Poincare, Paris, France.
2017 Jan **Mathematics Colloquium**, Rice University, Houston, TX.
2017 Jan **UCLA Combinatorics Seminar**, University of California Los Angeles, CA.
2017 Jan **UCSD Mathematics Colloquium**, University of California San Diego, La Jolla, CA.
2017 Jan **Large Random Structures in Two Dimensions** workshop, Institute Henri Poincare, Paris, France.
2016 Nov **MIT Combinatorics Seminar**, Cambridge, MA.
2016 Oct **Foundations of Computer Science** (FOCS) conference, New Brunswick, NJ.
2016 Sep **AMS Fall Eastern Sectional Meeting**, Bowdoin College, Brunswick, ME.
2016 Sep **Kronecker Coefficients Conference 2016**, City University London, United Kingdom.
2016 Jul **Formal Power Series and Algebraic Combinatorics** conference, Vancouver, Canada.
2016 Jun **University of Pennsylvania CAGE seminar**, Philadelphia, PA.
2016 Mar **Six-vertex model, dimers, shapes and all that** workshop, Simons Center for Geometry and Physics, Stony Brook, NY.

2016 Mar **UCLA Combinatorics Seminar**, Los Angeles, CA.
2015 Nov **Texas A& M University** Probability / Algebra and Combinatorics Seminar, College Station, TX.
2015 Nov **AMS Fall Eastern Sectional Meeting**, Special Session on Probability, Combinatorics and Statistical Mechanics, Rutgers University, New Brunswick, NJ.
2015 Nov **Haverford Mathematics Colloquium**, Haverford, PA.
2015 Oct **University of Rochester** Probability Seminar, Rochester, NY.
2015 Oct **Temple University Mathematics Colloquium**, Philadelphia, PA.
2015 July **Formal Power Series and Algebraic Combinatorics**, Daejeon, Korea.
2015 June **AMS-EMS-SPM joint meeting**, Special Session on Algebraic Combinatorics and Representation Theory, Porto, Portugal.
2015 May **Lattice Models: Exact Results and Combinatorics** workshop, Galileo Galilei Institute for Theoretical Physics, Florence, Italy.
2015 Apr **Limit Shapes** workshop, ICERM, Providence, RI.
2015 Mar **University of Virginia Algebra Seminar**, UVA, Charlottesville, VA.
2015 Feb **Columbia/Courant Probability Seminar**, Random Tilings, New York, NY.
2015 Feb **Princeton Combinatorics Seminar**, Princeton University, NJ.
2015 Jan **Joint AMS/MAA meeting**, Special Session on Probability and Applications, San Antonio, TX.
2014 Nov **Symbolic and Computational Methods for Tensors and Representation Theory**, Simons Institute, Berkeley, CA.
2014 Nov **IMA workshop** on Geometric and Enumerative Combinatorics, Minneapolis, MN.
2014 Nov **AIM workshop**, Palo Alto, CA.
2014 Oct **AMS Meeting**, Special Session on Combinatorial Representation Theory, Halifax, Canada.
2014 Sep **Geometric Complexity Theory workshop**, Simons Institute, Berkeley, CA.
2014 Jun **Formal Power Series and Algebraic Combinatorics**, Chicago, IL.
2014 Jun **Stanley 70th birthday** conference, Cambridge, MA.
2014 Jun **SIAM Discrete Mathematics** conference, Minneapolis, MN.
2014 Jan **UC Davis Mathematics Colloquium**, Davis, CA.
2014 Jan **Caltech Mathematics Colloquium**, Pasadena, CA.
2014 Jan **Institute of Science and Technology (IST Austria) Seminar**, Austria.
2014 Jan **ETH Zurich Special Lecture**, Zurich, Switzerland.
2013 Dec **Washington University Mathematics Colloquium**, St. Louis, MO.
2013 Dec **University of Pennsylvania Mathematics Colloquium**, Philadelphia, PA.
2013 Nov **Georgia Tech Mathematics Colloquium**, Atlanta, GA.
2013 Nov **Vanderbilt Mathematics Colloquium**, Nashville, TN.
2013 Oct **UC Berkeley Combinatorics Seminar**, Berkeley, CA.
2013 Oct **UCSD Combinatorics Seminar**, San Diego, CA.
2013 Sep **University of Washington Combinatorics Seminar**, Seattle, WA.
2013 Aug **Mathematics Congress of the Americas**, Guanajuato, Mexico.
2013 Jun **Formal Power Series and Algebraic Combinatorics**, Paris, France.
2013 Feb **Random tilings workshop**, SCGP, Stony Brook, NY.
2013 Jan **UCLA Probability Seminar**, Los Angeles, CA.
2012 Aug **UCLA Combinatorics Seminar**, Los Angeles, CA.
2012 Aug **Formal Power Series and Algebraic Combinatorics**, Nagoya, Japan.
2012 Jul **Workshop on Convex Polytopes**, RIMS, Kyoto, Japan.

2012 Mar **MSRI Postdoc seminar**, Berkeley, CA.
2012 Mar **UC Berkeley Combinatorics Seminar**, Berkeley, CA.
2012 Feb **MSRI/Evans Lecture**, Berkeley, CA.
2011 Dec **UCLA Combinatorics seminar**, Los Angeles, CA.
2011 Jun **Formal Power Series and Algebraic Combinatorics**, Reykjavic, Iceland.
2011 May **Microsoft Research, Theory Group** Redmond, WA.
2011 Apr **AMS Spring Eastern Sectional Meeting**, Worcester, MA.
2010 Nov **MIT Combinatorics Seminar**.
2010 Aug **Permutation Patterns Conference**, Dartmouth, NH.
2010 Aug **Formal Power Series and Algebraic Combinatorics Conference**, San Francisco, CA.
2010 Jan **Joint Mathematics Meeting of the AMS**, San Francisco, CA.

Teaching activities

Ph.D. students:

Chenchen Zhao: Mathematics Ph.D. candidate (expected graduation 2024), USC.
Shiyun Wang: Mathematics Ph.D. 2023, USC. Currently Dunham Jackson Assistant Professor, University of Minnesota.
Logan Crew: Mathematics Ph.D. 2020, University of Pennsylvania. Currently Research Assistant Professor, University of Waterloo, Canada.

Masters students:

Xiao Wang: M.A. Mathematics (exp 2023), USC.
Shiying Dong: M.A. Mathematics 2016, University of Pennsylvania.

Undergraduate students:

Jeffrey Ju: undergraduate research, summer 2023, USC.
Haimu Wang: undergraduate research, 2021-2023, USC.
William Chang: Provost Research Fellowship for undergraduate research, USC, 2020–2021.

Postdoctoral mentees:

Mark Rychnovsky, 2021-2024, USC.
Joshua Swanson, 2021-2024, USC.

Extracurricular:

2023–2025: Putnam Mathematical Competition editorial board member, Mathematical Association of America.
Training students for the Putnam Mathematical Competition: 2015, 2016 at University of Pennsylvania (team ranked 34th, then 24th, one honorable mention); 2019, 2020 at USC (a student in top 100, several in top 500)

Teaching Awards:

Good teaching award, Spring 2016, University of Pennsylvania Mathematics Department.
Good teaching award, Spring 2017, University of Pennsylvania Mathematics Department.

Courses:

2024 Spr *Seminar in Asymptotic Algebraic Combinatorics* (USC, Math 590, grad).
2023 Fall *Combinatorial Theory* (USC, Math 532, grad)
2023 Fall *Applied Combinatorics* (USC, Math 432, undegrad)
2023 Spr *Applied Combinatorics* (USC, Math 432, undegrad, 2 sections)

2022 Fall *Topics in Combinatorics*: Discrete Geometry and Statistical Mechanics (USC, Math 599, grad)
2022 Spr *Algebraic Combinatorics* (USC, Math 533, grad)
2022 Spr *Applied Combinatorics* (USC. Math 432, undergrad)
2021 Spr *Algebraic Combinatorics* (USC, Math 533, grad)
2021 Spr *Seminar in Problem Solving* (USC, Math 395, undergrad)
2020 Fall *Fundamental Concepts of Modern Algebra* (USC, Math 410, undergrad)
2020 Fall *Seminar in Problem Solving* (USC, Math 395, undergrad)
2019 Fall *Combinatorial analysis* (USC, Math 532, grad)
2019 Fall *Seminar in Problem Solving* (USC, Math 395, undergrad)
2019 Spr *Combinatorics* (USC, Math 432, undergrad)
2018 Fall *Combinatorial analysis* (USC, Math 532, grad)
2016 Fall *Combinatorial analysis* (UPenn, Math 580, grad)
2016 Fall *Putnam Problem Solving seminar* (UPenn) (undergrad)
2016 Spr *Differential Equations and Linear Algebra* (UPenn, Math 240, undergrad)
2015 Fall *Combinatorial analysis* (UPenn, Math 580, undergrad)
2015 Fall *Putnam Problem Solving seminar* (UPenn, undergrad)
2015 Spr *Combinatorial analysis and graph theory II*: Algebraic Combinatorics (UPenn, Math 581, grad)
2014 Fall *Combinatorial analysis and graph theory* (UPenn, Math 580, grad)
2014 Spr *Topics in Combinatorics: Algebraic Combinatorics* (UCLA, Math 285N, grad)
2013 Fall *Probability* (UCLA, Math 170A, undergrad)
2013 Wint *Optimization* (UCLA, Math 164, undergrad)
2011 Fall *Combinatorics*(UCLA, Math 180, undergrad)
2011 Spr *Linear Algebra and Differential Equations* (Harvard, Math 21b, undergrad)
2010 Spr *Algebraic Combinatorics– Symmetric functions* (Harvard, Math 99r, undergrad)
2009 Spr *Linear Algebra and Differential Equations* (Harvard, Math 21b, undergrad)
2008 Fall *Topics in Combinatorial Representation Theory* (Harvard, Math 277, grad), course assistant.
2008 Spr *Differential Equations for the Life Sciences* (Harvard, Math 19a), teaching fellow.
2004 -2005 *Project Laboratory in Mathematics* (MIT, 18.821, undergrad), teaching assistant.

Professional Activities and Service

Journal Editor–in–Chief:
Electronic Journal of Combinatorics, ISSN 1077–8926.

Putnam Mathematical Competition Editorial Board of the MAA member (2023-2025), consisting of three mathematicians composing and writing the exam.

Journals refereed for:
Advances in Mathematics, *Computational Complexity*, *Discrete Mathematics*, *Electronic Journal of Combinatorics* , *European Journal of Combinatorics*, *Journal of Algebraic Combinatorics*, *Journal of Combinatorial Theory Series A*, *Journal of Statistical Physics*, *Journal of the American Mathematics Society*, *Random Structures and Algorithms*, *Selecta*, *SIAM Journal of Computing*.

Grant organizations reviewed for:
National Science Foundation (NSF, USA), Czech Science Foundation (Czech Republic), Ministry of Education and Science of the Russian Federation, Dutch Research Council (NWO, the Netherlands)

Programs, workshop and conference organization:

- *Categorification and computation in algebraic combinatorics* long program, Fall 2025, ICERM, Providence, RI.
- *Geometry, Statistical Mechanics, Integrability* long program, Spring 2024, IPAM, Los Angeles.
- *Integrability and Combinatorics at Finite Temperatures* program, June 2021, MATRIX, Melbourne, Australia.
- *Asymptotic Algebraic Combinatorics* workshop, February 2020, Institute for Pure and Applied Mathematics (IPAM, UCLA), Los Angeles, CA.
- *SoCal Discrete Math Symposium*, January 2020, USC, Los Angeles, CA.
- *Asymptotic Algebraic Combinatorics* workshop, March 2019, Banff International Research Station, Banff, Canada.
- *Combinatorics and Complexity of Kronecker coefficients* workshop, November 2014, American Institute of Mathematics, Palo Alto, CA.

Scientific committee member:

- Summer School in Discrete Mathematics (Czech Republic), 2022–current.
- Southern California Discrete Mathematics Symposium, 2019–current .
- Lattice Paths, Combinatorics and Interactions 2021 at CIRM, France.
- Formal Power Series and Algebraic Combinatorics conference 2016.
- Mid-Atlantic Algebraic Geometry and Combinatorics conference (2015, 2016, 2017).

Panelist:

- *"Professional Development"* seminar, MSRI, October 2021.
- *National Science Foundation CAREER* panel, Fall 2019.
- *"Towards a new Theoretical Biology"* workshop, April 2018, University of Pennsylvania.
- *"Publish, don't perish"* panel on writing research papers at the MAAGC 2017.
- *"Surviving the on-campus interview"* panel at the Joint AMS/MAA meetings 2015.

Invited participant at:

- *Genome Architecture and Function* meeting and summer school, June 2023, Sofia, Bulgaria.
- *First Annual Meeting of Young Bulgarian Mathematicians*, May 2021, online.
- *Genome Architecture and Dynamics Workshop and International Summer School*, July 2019, Varna, Bulgaria.
- *Encuentro Colombiano de Combinatoria 2018* (Colombian summer school in combinatorics), June 2018, Barranquilla, Colombia.
- *Encuentro Colombiano de Combinatoria 2016* (Colombian summer school in combinatorics), June 2016, Medellin, Colombia.
- *St. Petersburg Summer-school on Probability and Statistical Physics*(SPSPSP), St. Petersburg, Russia, June 2012.

University Service

Member of **University Committee on Appointments, Promotions and Tenure (UCAPT)** advising the Provost, USC, 2023-2024.

Seminar co-organizer of:

- Mathematics Colloquium, USC, 2022–2024.
- LA Combinatorics and Complexity seminar, 2020, online.
- Combinatorics seminar, USC, 2019–current.
- CAGE (Combinatorics, Algebraic Geometry and Enumeration) seminar, University of Pennsylvania, 2014-2017.

- Probability seminar, University of Pennsylvania, 2015-2017.
- Mathematics Colloquium, University of Pennsylvania, 2014–2015.
- Combinatorics seminar, UCLA, 2012-2014.

Hiring committee member at USC Mathematics department for: 2020-2021, NTT hiring committee. 2021-2022, NTT hiring committee.

Merit committee member at USC Mathematics department for: 2019–2020, 2022-2023.

Undergraduate Committee at USC Mathematics: 2022-2023, and 2023-2024.

Graduate screening exam Committee at USC Mathematics: Fall 2022 and Spring 2023, Probability exam.

Graduate admissions committee at University of Pennsylvania, winter 2015.

Supervisor and coach for the USC participation at the Putnam competition 2019, 2020.

Chair(and coach) of the *Prize committee* (University of Pennsylvania Math), running the **Putnam Problem Solving seminar**, team selection/training and exam administration. (in Putnam 2015 UPenn team ranked 34 out of 540 institutions; in 2016 UPenn ranked 24 with one honorable mention and 6 students in top 500)

Rotate the chair committee member: Spring 2021, USC. 2015–2016, University of Pennsylvania.

Colloquium chair:
2022-2024, University of Southern California.
2014–2015, University of Pennsylvania.