Brendon Rhoades

Professor of Mathematics, University of California San Diego

bprhoades@math.ucsd.edu
Department of Mathematics, UC San Diego

http://www.math.ucsd.edu/~bprhoades
9500 Gilman Drive #0112, La Jolla, CA 92093-0112

Education

Ph.D. in Mathematics, University of Minnesota, Minneapolis, MN. July 2008.
Advisor: Victor Reiner

B.S. in Mathematics (Physics minor), University of Michigan, Ann Arbor, MI. April 2005.

Employment

University of California, San Diego, La Jolla, CA.
Professor, Department of Mathematics. 2020-present.
Associate Professor, Department of Mathematics. 2016-2020.
Assistant Professor, Department of Mathematics. 2012-2016.

University of Southern California, Los Angeles, CA.
NTT Assistant Professor, Department of Mathematics. 2011-2012.

Massachusetts Institute of Technology, Cambridge, MA.
NSF Postdoctoral Research Fellow/Instructor of Applied Mathematics. 2009-2011.
Sponsoring Scientist: Richard Stanley.

University of California, Berkeley, Berkeley, CA.
NSF Postdoctoral Research Fellow/Visiting Assistant Professor. 2008-2009.
Sponsoring Scientist: Mark Haiman.

Visiting Positions

ICERM. Providence, RI. Fall, 2025.

Awards

NSF Grant (DMS-2246846). $218,577. 2023-2027.
'Combinatorics and Representation Theory'

NSF Grant (DMS-1953781). $128,583. 2020-2023.
'Combinatorics, Representations, and Catalan Theory'

Simons Foundation Collaboration Grant. $42,000. 2020-2025.
(Awarded 2020, Declined due to NSF Grant DMS-1953781.)

NSF Grant (DMS-1500838). $180,000. 2015-2020.
'Combinatorics, Representations, and Catalan Theory'

NSA Young Investigator Award (Proposal 141013). $40,000. 2016-2018.
'Topics in Algebraic Combinatorics'
(Awarded 2015, Declined due to NSF Grant DMS-1500838.)

Simons Foundation Collaboration Grant. $35,000. 2015-2020.
'Research in Algebraic Combinatorics'
(Awarded 2015, Declined due to NSF Grant DMS-1500838.)

NSF Grant (DMS-1068861). $135,000. 2011-2015.
'Combinatorics and Representation Theory'

NSF Mathematical Sciences Postdoctoral Research Fellowship. 2008-2011.

Graduate Student Fellowship, University of Minnesota. 2005-2007.

Preprints

66. **Forgotten characters.** (with Kyle Celano) Submitted, 2026. arXiv:2608.20002
65. **Derangement permutation matrices and orbit harmonics.** (with Yupeng Li and Jasper Liu) Submitted, 2026. arXiv:2607.28157
64. **Superspace coinvariants for wreath products.** (with Sutanay Bhattacharya) Submitted, 2026. arXiv:2606.30977
63. **Superspace coinvariants and inverse systems for GLn(Fq).** (with Andy Wilson) Submitted, 2026. arXiv:2606.11549
62. **Big Varchenko–Gelfand rings and orbit harmonics.** Submitted, 2026. arXiv:2508.18602
61. **A proof of the Fields Conjectures.** (with Satoshi Murai and Andy Wilson) Submitted, 2025. arXiv:2505.24027.

Accepted Papers Awaiting Publication

60. **Moments of permutation statistics by cycle type.** (with Zach Hamaker) Accepted, Forum Math. Sigma, 2026. arXiv:2503.17556.
59. **Harmonics and graded Ehrhart theory.** (with Vic Reiner) Accepted, J. Comb. Alg., 2026. arXiv:2407.06511.
58. **Tutte polynomials in superspace.** (with Vasu Tewari and Andy Wilson) Accepted, Sel. Math. New Ser., 2026. arXiv:2404.01450.
57. **Partial permutations and character evaluations.** (with Zach Hamaker) Accepted, Comb. Theory, 2026. arXiv:2503.17552.

Published Papers

56. **Equivariant cohomology and orbit harmonics.** (with Raymond Chou and Tomoo Matsumura) Transform. Groups (2026), `https://doi.org/10.1007/s00031-026-09968-w`. (40 pages)
55. **Generalizations of the flag variety tied to the Macdonald-theoretic delta operators.** Chapter for Handbook of Combinatorial Algebraic Geometry: Subvarieties of the Flag Variety. CRC Press. Taylor & Francis. 2026.
54. **Zigzags, contingency tables, and quotient rings.** (with Jaeseong Oh) J. London Math. Soc., 112 (5) (2025), e70344.
53. **Involution matrix loci and orbit harmonics.** (with Jasper Liu, Yichen Ma, and Hai Zhu) Math. Z., 310 (23) (2025) `https://doi.org/10.1007/s00209-025-03736-4`
52. **Superspace coinvariants and hyperplane arrangements.** (with Robert Angarone, Patricia Commins, Trevor Karn, and Satoshi Murai) Adv. Math., 467, 2025, 110185. (36 pages)
51. **Increasing subsequences, matrix loci, and Viennot shadows.** Forum Math. Sigma, 2024;Vol. 1212:e97. doi:10.1017/fms.2024.75 (23 pages)
50. **The Hilbert series of the superspace coinvariant ring.** (with Andy Wilson) Forum Math. Pi, 2024;Vol. 12:e16. 1–35. doi:10.1017/fmp.2024.14. (35 pages)
49. **Increasing subsequences and Kronecker coefficients.** (with Jonathan Novak) Proc. Sympos. Pure Math., 110 (2024), 87–91.
48. **Zonotopal algebras, orbit harmonics, and Donaldson-Thomas invariants of symmetric quivers.** (with Markus Reineke and Vasu Tewari) Int. Math. Res. Not. IMRN, Volume 2023 (2023), Issue 23, 20169–20210.
47. **The combinatorics of supertorus sheaf cohomology.** (with Jesse Kim and Jeff Rabin) J. Geom. Phys., 193 (2023), 104963. (13 pages)
46. **Set partitions, fermions, and skein relations.** (with Jesse Kim) Int. Math. Res. Not. IMRN, Volume 2023 (2023), Issue 11, 9427–9480.
45. **A proof of the fermionic Theta coinvariant conjecture.** (with Alessandro Iraci and Marino Romero) Discrete Math., 346 (7) (2023), 113360. (12 pages)
44. **Haglund's conjecture for multi-t Macdonald polynomials.** (with Seung Jin Lee and Jaeseong Oh) Discrete Math., 346 (6) (2023), 113360 (12 pages)
43. **Spanning subspace configurations and representation stability.** (with Brendan Pawlowski and Eric

Ramos) Electron. J. Combin., 30 (1) (2023), P1.7.

42. **Set superpartitions and superspace duality modules.** (with Andrew Timothy Wilson) Forum Math. Sigma, 10 (2022), E105. doi:10.1017/fms.2022.90. (54 pages)
41. **Plethysm and a character embedding problem of Miller.** C. R. Math., 360 (2022), 1113–1116.
40. **Packed words and quotient rings.** (with Daniël Kroes) Discrete Math., 345 (9) (2022), 112945. (10 pages)
39. **Cyclic sieving and orbit harmonics.** (with Jaeseong Oh) Math. Z., 300 (2022), 639–660.
38. **Lefschetz theory for exterior algebras and fermionic diagonal coinvariants.** (with Jongwon Kim) Int. Math. Res. Not. IMRN, Volume 2022 (2022), Issue 4, 2906–2933.
37. **Higher Specht bases for generalizations of the coinvariant ring.** (with Maria Gillespie) Ann. Comb., 25 (1), (2021), 51–77.
36. **Spanning subspace configurations.** Sel. Math. New Ser., 27 (8) (2021). Available at `https://doi.org/10.1007/s00029-021-00617-6` (36 pages)
35. **Boolean product polynomials, Schur positivity, and Chern plethysm.** (with Sara Billey and Vasu Tewari) Int. Math. Res. Not. IMRN, Volume 2021 (2021), Issue 21, 16636–16670.
34. **Harmonic bases for generalized coinvariant algebras.** (with Tianyi Yu and Zehong Zhao) Electron. J. Combin., 27 (4) (2020), P4.16 (23 pages).
33. **Generalized coinvariant algebras for wreath products.** (with Kin Tung Jonathan Chan) Adv. Appl. Math., 120 (2020), Article 102060.
32. **Vandermondes in superspace.** (with Andrew Timothy Wilson) Trans. Amer. Math. Soc., 373 (6) (2020), 4483–4516.
31. **The polytabloid basis expands positively into the web basis.** Forum Math. Sigma, 7 (2019), e26. (8 pages)
30. **Line arrangements and r-Stirling partitions.** (with Andrew Timothy Wilson) J. Comb. (Special issue honoring Jeff Remmel) 10 (3) (2019), 411–431.
29. **Hall-Littlewood expansions of Schur delta operators at t = 0.** (with Jim Haglund and Mark Shimozono) Sém. Loth. Comb., B79c (2019), 20 pp.
28. **A flag variety for the Delta Conjecture.** (with Brendan Pawlowski) Trans. Amer. Math. Soc., 374 (2019), 8195–8248.
27. **Hall-Littlewood polynomials and a Hecke action on ordered set partitions.** (with Jia Huang and Travis Scrimshaw) Proc. Amer. Math. Soc., 147 (5) (2019), 1839–1850.
26. **Ordered set partitions and the 0-Hecke algebra.** (with Jia Huang) Algebr. Comb., 1 (1) (2018), 47-80.
25. **Ordered set partitions, generalized coinvariant algebras, and the Delta Conjecture.** (with Jim Haglund and Mark Shimozono) Adv. Math., 329 (2018), 851-915.
24. **Ordered set partition statistics and the Delta Conjecture.** J. Combin. Theory Ser. A, 154 (2018), 172–217.
23. **Tail positive words and generalized coinvariant algebras.** (with Andrew Timothy Wilson) Electron. J. Combin., 24 (3) (2017), P3.21. (29 pages)
22. **Evidence for parking conjectures.** J. Combin. Theory Ser. A, 146 (2017), 201–238.
21. **A skein action of the symmetric group on noncrossing partitions.** J. Algebraic Combin., 45 (1) (2017), 81–127.
20. **The polytope of Tesler matrices.** (with Karola Mészáros and Alejandro Morales) Selecta Math. (N.S.), 23 (1) (2017), 425–454.
19. **Cyclic sieving and rational Catalan theory.** (with Michelle Bodnar) Electron. J. Combin., 23 (2) (2016) P2.4. (38 pages)
18. **Alexander duality and rational associahedra.** SIAM J. Discrete Math., 29 (1) (2015), 431-460.
17. **Parking spaces.** (with Drew Armstrong and Vic Reiner) Adv. Math., 269 (2015), 647- 706.
16. **Bijections for the Shi and Ish arrangements.** (with Emily Leven and Andrew Timothy Wilson) European J. Combin. 39C (2014), 1-23.
15. **Parking structures: Fuss analogs.** J. Algebraic Combin., 40 (2) (2014), 417-473.
14. **Extending the parking space.** (with Andrew Berget) J. Combin. Theory Ser. A, 123 (1) (2014), 43-56.

13. **Rational associahedra and noncrossing partitions.** (with Drew Armstrong and Nathan Williams) Electron. J. Combin., 20 (3) (2013) P54. (27 pages)
12. **Combinatorics of Tesler matrices in the theory of parking functions and diagonal harmonics.** (with Drew Armstrong, Adriano Garsia, James Haglund, and Bruce Sagan) J. Comb., 3 (3) (2012), 451-494.
11. **The Shi arrangement and the Ish arrangement.** (with Drew Armstrong) Trans. Amer. Math. Soc., 364 (2012), 1509-1528.
10. **Enumeration of connected Catalan objects by type.** European J. Combin., 32 (2) (2011), 330-338.
9. **Bitableaux and zero sets of dual canonical basis elements.** (with Mark Skandera) Ann. Comb., 13 (3) (2011), 499-528.
8. **Cyclic sieving and cluster multicomplexes.** Adv. in Appl. Math., 45 (2010), 470-486.
7. **The cluster and dual canonical bases of Z[x11, . . . , x33] are equal.** Discrete Math. Theor. Comput. Sci., 12 (5) (2010), 97-124.
6. **Hall-Littlewood polynomials and fixed point enumeration.** Discrete Math., 310 (4) (2010), 869-876.
5. **Promotion and cyclic sieving via webs.** (with Kyle Petersen and Pasha Pylyavskyy) J. Algebraic Combin., 30 (1) (2009), 19-41.
4. **Cyclic sieving, promotion, and representation theory.** J. Combin. Theory Ser. A, 117 (1) (2010), 38-76.
3. **Kazhdan-Lusztig immanants and products of matrix minors, II.** (with Mark Skandera) Linear Multilinear Algebra, 58 (2) (2010), 137-150.
2. **Kazhdan-Lusztig immanants.** (with Mark Skandera) J. Algebra, 304 (2) (2006), 793-811.
1. **Temperley-Lieb immanants.** (with Mark Skandera) Ann. Comb., 9 (4) (2005), 451-495.

Manuscripts not Intended for Publication

1. **Characters of local and regular permutation statistics.** (with Zach Hamaker) Most recent version: 2024.

Presentation Venues

139. **Important Papers in Algebraic Combinatorics Seminar.** University of Pennsylvania. August, 2026. (Invited, via Zoom).
138. **Formal Power Series and Algebraic Combinatorics conference.** Seattle, WA, USA. July, 2026.
137. **SIAM Conference on Discrete Mathematics.** San Diego, CA, USA. June, 2026. (Invited, Plenary)
136. **Triangle Lectures in Combinatorics.** Winston-Salem, NC, USA. April, 2026. (Invited)
135. **Combinatorics Seminar, UCSD.** San Diego, CA, USA. April, 2026.
134. **AMS Special Session on "Symmetric functions and subvarieties of flag varieties".** Savannah, GA, USA. March, 2026. (Invited)
133. **Mathematics Colloquium.** University of Minnesota. Minneapolis, MN, USA. February, 2026. (Invited)
132. **Combinatorics Seminar.** University of Minnesota. Minneapolis, MN, USA. February, 2026. (Invited)
131. **Algebra Seminar.** University of Oregon. Eugene, OR, USA. January, 2026. (Invited)
130. **Arrangements in Osaka.** Osaka, Japan. December, 2025. (Invited)
129. **Combinatorics Seminar.** National Taiwan Normal University. Taipei, Taiwan. December, 2025. (Invited)
128. **Millican Colloquium.** University of North Texas. Denton, TX, USA. November, 2025. (Invited)
127. **Algebra Seminar.** University of North Texas. Denton, TX, USA. November, 2025. (Invited)
126. **AMS Special Session on "Hyperplane Arrangements and Polytopes".** New Orleans, LA, USA. October, 2025. (Invited)
125. **ICERM Workshop on Category Theory, Combinatorics, and Machine Learning.** Providence, RI, USA. September, 2025. (Invited)
124. **Richard P. Stanley Seminar in Combinatorics.** Cambridge, MA, USA. September, 2025. (Invited)
123. **Conference on q, t-Combinatorics in Algebra, Geometry and Topology.** Cortona, Italy. June, 2025.

(Invited)

122. **Combinatorics Seminar.** KTH. Stockholm, Sweden. June, 2025. (Invited)
121. **Algebra Seminar.** UCSD. San Diego, CA, USA. May, 2025.
120. **AMS Special Session on "Recent Developments in Algebraic and Combinatorics Aspects of Polytopes".** April, 2025. Hartford, CT, USA. (Invited)
119. **Algebraic Geometry and Number Theory Seminar.** University of California, Davis. January, 2025. (Invited, via Zoom)
118. **Schubert Seminar.** October, 2024. (Invited, via Zoom)
117. **One-Day Meeting on Superspace coinvariants, hyperplane arrangements and Hessenberg varieties.** Waseda University. Tokyo, Japan. September, 2024. (Invited)
116. **Combinatorics and Representation Theory Seminar.** Korea Institute for Advanced Study. September, 2024. (Invited, via Zoom)
115. **Combinatorics Seminar, University of California, Berkeley.** Berkeley, CA, USA. April, 2024. (Invited)
114. **Combinatorics and Geometry Seminar, University of Washington.** Seattle, WA, USA. April, 2024. (Invited)
113. **Graduate Student Colloquium, UCSD.** San Diego, CA, USA. January, 2024.
112. **Combinatorics Seminar, Brown University.** Providence, RI, USA. October, 2023. (Invited)
111. **Combinatorics Seminar, University of Southern California.** Los Angeles, CA, USA. September, 2023. (Invited)
110. **One-Day Workshop on combinatorics related to Hessenberg varieties, Seoul National University.** Seoul, South Korea. September, 2023. (Invited)
109. **Workshop, International Christian University.** Tokyo, Japan. August, 2023. (Invited)
108. **Hokkaido University Summer Institute.** Sapporo, Japan. August, 2023. (Invited)
107. **Formal Power Series and Algebraic Combinatorics conference.** Davis, CA, USA. July, 2023.
106. **Minnesota Research Workshop in Algebra & Combinatorics.** Minneapolis, MN, USA. May, 2023. (Invited)
105. **AMS Special Session on "Combinatorics and Representation Theory".** Fresno, CA, USA. May, 2023. (Invited)
104. **Cascade Lectures in Combinatorics.** Portland, OR, USA. April, 2023. (Invited)
103. **AMS Special Session on "Macdonald theory in the intersection of combinatorics, algebra, and geometry".** Atlanta, GA, USA. March, 2023. (Invited)
102. **Mathematics Colloquium, Kennesaw State University.** Kennesaw, GA, USA. March, 2023. (Invited)
101. **Michigan State University Combinatorics Seminar.** September, 2022. (Invited, via Zoom)
100. **University of Southern California Combinatorics Seminar.** Los Angeles, CA, USA. August, 2022. (Invited)
99. **Symmetric Functions in Combinatorics.** Seoul National University. August, 2022. (Invited, via Zoom)
98. **Important Papers in Algebraic Combinatorics Seminar.** University of Pennsylvania. July, 2022. (Invited, via Zoom)
97. **AlCoVE: an Algebraic Combinatorics Virtual Expedition.** June, 2022. (Invited, via Zoom)
96. **One-day workshop on web bases.** KIAS. Seoul, South Korea. December, 2021. (Invited, via Zoom)
95. **Dynamical Algebraic Combinatorics.** BIRS. Kelowna, BC, Canada. November, 2021. (Invited, via Zoom)
94. **Important Papers in Algebraic Combinatorics Seminar.** University of Pennsylvania. August, 2021. (Invited, via Zoom)
93. **Mathematics Colloquium.** Seoul National University. April, 2021. (Invited, via Zoom)
92. **Afternoon Seminar on Hyperplane Arrangements.** June, 2020. (Shinshu University, Japan) (Invited, via Zoom)
91. **Algebraic Combinatorics Online Workshop (KTH, Sweden).** April, 2020. (Invited, via Zoom)
90. **University of Minnesota Combinatorics Seminar.** April, 2020. (Invited, via Zoom)

89. **Rocky Mountain Algebraic Combinatorics Seminar.** Fort Collins, CO, USA. December, 2019. (Invited)
88. **2nd Annual Meeting of SIAM Texas-Louisiana Section.** Dallas, TX, USA. November, 2019. (Invited)
87. **Mathematics Colloquium, University of Texas at Dallas.** Richardson, TX, USA. November, 2019. (Invited)
86. **Discrete Math Seminar, Arizona State University.** Tempe, AZ, USA. September, 2019. (Invited)
85. **Mathematics Colloquium, Arizona State University.** Tempe, AZ, USA. September, 2019. (Invited)
84. **Combinatorics Seminar, University of Michigan.** Ann Arbor, MI, USA. September, 2019. (Invited)
83. **Hilbert schemes, categorification, and combinatorics.** University of California, Davis. Davis, CA, USA. June, 2019. (Invited)
82. **Algebraic and geometric methods in combinatorics.** CanaDAM 2019. Vancouver, BC, Canada. May, 2019. (Invited)
81. **Mathematics Colloquium.** Shinshu University. Matsumoto, Japan. April, 2019. (Invited)
80. **Mathematics Colloquium.** Sungkyunkwan University. Suwon, South Korea. April, 2019. (Invited)
79. **One-Day Meeting in Combinatorics.** Applied Algebra and Optimization Research Center. Sungkyunkwan University. Suwon, South Korea. April, 2019. (Invited)
78. **Combinatorics Seminar, Washington University in St. Louis.** St. Louis, MO, USA. March, 2019. (Invited)
77. **Mathematics Colloquium, Washington University in St. Louis.** St. Louis, MO, USA. March, 2019. (Invited)
76. **CombinaTexas.** College Station, TX, USA. March, 2019. (Invited, Plenary)
75. **Representation Theory Connections to (q, t)-Combinatorics.** Banff, AB, Canada. January, 2019. (Invited)
74. **Mathematics Colloquium, San Diego State University.** San Diego, CA, USA. October, 2018. (Invited)
73. **Mathematics Colloquium, Michigan State University.** East Lansing, MI, USA. September, 2018. (Invited)
72. **AMS Special Session on Macdonald Polynomials and Related Structures.** Nashville, TN, USA. April, 2018. (Invited)
71. **Mathematics Colloquium, University of Pennsylvania.** Philadelphia, PA, USA. March, 2018. (Invited)
70. **Combinatorics Seminar, UQAM.** Montréal, QC, Canada. March, 2018. (Invited)
69. **Combinatorics Seminar, University of Southern California.** Los Angeles, CA, USA. February, 2018.
68. **Joint Mathematical Meetings.** AMS Special Session on Dynamical Algebraic Combinatorics. San Diego, CA, USA. January, 2018. (Invited)
67. **Algebra and Discrete Mathematics Seminar, University of California, Davis.** Davis, CA, USA. December, 2017. (Invited)
66. **Combinatorics Seminar, University of California, San Diego.** San Diego, CA, USA. November, 2017.
65. **AMS Special Session on Combinatorial Representation Theory.** Riverside, CA, USA. November, 2017. (Invited)
64. **Combinatorics Seminar, University of Michigan.** Ann Arbor, MI, USA. September, 2017.
63. **Equivariant Combinatorics.** Université de Montréal. Montréal, QC, Canada. June, 2017. (Invited)
62. **Combinatorics Seminar, Caltech.** Pasadena, CA, USA. March, 2017. (Invited)
61. **Mathematics Colloquium, Western Washington University.** Bellingham, WA, USA. December, 2016. (Invited)
60. **Combinatorics Seminar, University of Washington.** Seattle, WA, USA. November, 2016.
59. **Combinatorics Seminar, University of Minnesota.** Minneapolis, MN, USA. October, 2016.
58. **Summer Conference on Hyperplane Arrangements.** Hokkaido University. Sapporo, Japan. August, 2017. (Invited)
57. **Workshop on Positivity in Algebraic Combinatorics.** Korea Institute for Advanced Study (KIAS). Seoul, South Korea. June, 2016. (Invited)
56. **AMS Special Session on Combinatorial Ideals and Applications.** Fargo, ND, USA. April, 2016. (Invited)
55. **AMS Special Session on Algebraic Combinatorics.** Salt Lake City, UT, USA. April, 2016. (Invited)
54. **Combinatorics Seminar, University of Southern California.** Los Angeles, CA, USA. March, 2016. (Invited)

53. **Joint Mathematics Meetings.** AMS Special Session on Algebraic and Topological Methods in Combinatorics. Seattle, WA, USA. January, 2016. (Invited)
52. **Algebra and Discrete Mathematics Seminar, University of California, Davis.** Davis, CA, USA. December, 2015. (Invited)
51. **Invited Address, AMS Western Sectional Spring Meeting.** Las Vegas, NV, USA. April, 2015. (Invited, Plenary)
50. **Graduate Student Colloquium, University of California, San Diego.** San Diego, CA, USA. March, 2015.
49. **Combinatorics Seminar, University of California, Los Angeles.** Los Angeles, CA, USA. January, 2015. (Invited)
48. **AMS Special Session on Generalized Catalan Algebraic Combinatorics.** Halifax, NS, Canada. October, 2014. (Invited)
47. **Combinatorics Seminar, University of Michigan.** Ann Arbor, MI, USA. September, 2014. (Invited)
46. **Algebra-Geometry-Combinatorics Seminar, San Francisco State University.** San Francisco, CA, USA. May, 2014.
45. **Combinatorics, Algebra, and Geometry Seminar, University of Pennsylvania.** Philadelphia, PA, USA. April, 2014. (Invited)
44. **Center for Communications Research.** La Jolla, CA, USA. October, 2013. (Invited)
43. **Canadian Discrete and Algorithmic Mathematics 2013.** St. John's, NL, Canada. June, 2013. (Invited)
42. **Algebra-Geometry-Combinatorics Seminar, University of Illinois, Urbana-Champaign.** Urbana, IL, USA. April, 2013. (Invited)
41. **Combinatorics Seminar, University of Washington.** Seattle, WA, USA. February, 2013.
40. **Discrete Mathematics Seminar, University of British Columbia.** Vancouver, BC, Canada. January, 2013. (Invited)
39. **Mathematics Colloquium, University of California, San Diego.** La Jolla, CA, USA. November, 2012.
38. **Algebra & Discrete Mathematics Seminar, University of California, Davis.** Davis, CA, USA. May, 2012. (Invited)
37. **Mathematics Colloquium, Washington University in St. Louis.** Saint Louis, MO, USA. February, 2012. (Invited)
36. **Mathematics Colloquium, University of Massachusetts, Boston.** Boston, MA, USA. February, 2012. (Invited)
35. **Mathematics Colloquium, University of South Florida.** Tampa, FL, USA. February, 2012. (Invited)
34. **Mathematics Colloquium, Syracuse University.** Syracuse, NY, USA. January, 2012. (Invited)
33. **Mathematics Colloquium, Loyola University - Chicago.** Chicago, IL, USA. January, 2012. (Invited)
32. **Mathematics Colloquium, University of California, San Diego.** La Jolla CA, USA. January, 2012. (Invited)
31. **University of California, Los Angeles Combinatorics Seminar.** Los Angeles, CA, USA. October, 2011. (Invited)
30. **Formal Power Series and Algebraic Combinatorics conference.** Rekjavik, Iceland. June, 2011.
29. **Center for Communications Research.** Princeton, NJ, USA. March, 2011. (Invited)
28. **Mathematics Colloquium, University of Waterloo.** Waterloo, ON, Canada. January, 2011. (Invited)
27. **Mathematics Colloquium, The Ohio State University.** Columbus, OH, USA. January, 2011. (Invited)
26. **AMS Special Session on Algebraic Combinatorics.** South Bend, IN, USA. November, 2010. (Invited)
25. **Dartmouth Combinatorics Seminar.** Hanover, NH, USA. May, 2010. (Invited)
24. **AMS Special Session on Combinatorial Representation Theory.** Saint Paul, MN, USA. April, 2010. (Invited)
23. **University of Miami Combinatorics Seminar.** Miami, FL, USA. March, 2010. (Invited)
22. **AMS Special Session on Algebraic Combinatorics.** University Park, PA, USA. October, 2009. (Invited)
21. **MIT Combinatorics Seminar.** Cambridge, MA, USA. September, 2009. (Invited)
20. **Bay Area Discrete Math Day.** Stanford, CA, USA. September, 2008. (Invited)

19. **Formal Power Series and Algebraic Combinatorics conference.** Vina del Mar, Chile. June, 2008.
18. **Algebra & Discrete Mathematics Seminar, University of California, Davis.** Davis, CA, USA. May, 2008. (Invited)
17. **Graduate Student Combinatorics Conference.** Davis, CA, USA. April, 2008.
16. **Representation Theory, Geometry, and Combinatorics Seminar, University of California, Berkeley.** Berkeley, CA, USA. April, 2008. (Invited)
15. **AMS Special Session on Combinatorial Representation Theory, Topological Combinatorics, and Interactions Between Them.** Bloomington, IN, USA. April, 2008. (Invited)
14. **Algebra-Geometry-Combinatorics Seminar, San Francisco State University.** San Francisco, CA, USA. February, 2008. (Invited)
13. **Geometry, Algebra, and Singularities Seminar, Northeastern University.** Boston, MA, USA. November, 2007.
12. **MIT Combinatorics Seminar.** Cambridge, MA, USA. November, 2007.
11. **Combinatorics Seminar, University of Michigan.** Ann Arbor, MI, USA. September, 2007. (Invited)
10. **Combinatorics Seminar, University of Minnesota.** Minneapolis, MN, USA. September, 2007.
9. **Graduate Student Combinatorics Conference.** Seattle, WA, USA. April, 2007.
8. **Combinatorics Seminar, University of California, Berkeley.** Berkeley, CA, USA. December, 2006.
7. **Combinatorics Seminar, University of Washington.** Seattle, WA, USA. November, 2006.
6. **Combinatorics Seminar, University of Minnesota.** Minneapolis, MN, USA. September, 2006.
5. **Combinatorics Seminar, University of Kansas.** Lawrence, KS, USA. September, 2006.
4. **Graduate Student Combinatorics Conference.** Madison, WI, USA. April, 2006.
3. **Graduate Student Combinatorics Conference.** Minneapolis, MN, USA. April, 2005.
2. **Combinatorics Seminar, University of Minnesota.** Minneapolis, MN, USA. March, 2005. (Invited)
1. **Applied Algebra Seminar, York University.** Toronto, ON, Canada. February, 2005. (Invited)

Teaching Experience

Math 188 - Algebraic Combinatorics. UCSD. W20, F21, W26.
Math 190B - Foundations of Topology II. UCSD. W20, S21, W26.
Math 264C - (Graduate) Combinatorics III. UCSD. S23, S25.
Math 202C - Applied Algebra III. UCSD. S16, S17, S18, S24, S25.
Math 264B - (Graduate) Combinatorics II. UCSD. W19, W23, W25.
Math 18 - Linear Algebra. UCSD. W24.
Math 202B - Applied Algebra II. UCSD. W15, W17, W18, W19, W21, W23.
Math 190A - Foundations of Topology I. UCSD. F14, W16, W18, W22.
Math 31AH - Honors Linear Algebra. UCSD. F21.
Math 184 - Enumerative Combinatorics. UCSD. F13, F17, F18, W21.
Math 100C - Abstract Algebra III. UCSD. S17, S20.
Math 264A - (Graduate) Combinatorics I. UCSD. F18.
Math 154 - Discrete Math & Graph Theory. UCSD. W17.
Math 109 - Introduction to Mathematical Reasoning. UCSD. W14, S16.
Math 20A - Calculus for Science and Engineering I. UCSD. F13, S16.
Math 200A - (Graduate) Algebra I. UCSD. F15.
Math 103A - Modern Algebra I. UCSD. W14.
Math 262A - Reflection Groups. UCSD. S13.
Math 20B - Calculus for Science and Engineering II. UCSD. W13.
Math 104A - Number Theory I. UCSD. F12.

Math 225 - Linear Algebra and Differential Equations. USC. W12.
Math 117 - Introduction to Mathematics for Business and Economics. USC. F11.
18.01 - Calculus 1. MIT. F09.
Math 281 - Representation Theory. UC - Berkeley. W09.
Math 1271 - Calculus 1. University of Minnesota. F07.
Math 1142 - Short Calculus. University of Minnesota. F05, F06.

Mentoring

Postdoctoral Scholars
John Lentfer — SEW Assistant Professor, 2026–2029.
Raymond Chou — SEW Assistant Professor, 2023–2026; now a Visiting Scholar at UCSD, working in AI.
Joshua Swanson — SEW Assistant Professor, 2018–2021; now at CCR.
Sean Griffin — Teaching Visitor, Fall 2020; now a tenure-track assistant professor at U. North Texas.
Marino Romero — UC Presidential Fellow, Summer 2019; now a tenure-track assistant professor at U. Minnesota, Mankato.

Ph.D. Students
Saintan Wu
Hai Zhu
Weston Miller
Sutanay Bhattacharya (Advanced to Candidacy, Winter 2026)
Jasper Liu (Advanced to Candidacy, Winter 2025)
Nathaniel Libman (Graduated, Spring 2025, now at Art of Problem Solving)
Tianyi Yu (Graduated, Spring 2024, now a JL Doob Assistant Professor at UIUC)
Jesse Kim (Graduated, Spring 2024, now a postdoc at U. Florida)
Daniël Kroes (Graduated, Spring 2021, now at Rubrik)
Kyle Meyer (Graduated, Spring 2022, now a lecturer at UCSD)
Dun Qiu (Graduated, Spring 2019, now an associate professor at the Center for Combinatorics at Nankai U.)
Michelle Bodnar (Graduated, Spring 2018, now at Google)

Undergraduate Research Students
Chen-an "Jack" Chou, Fall 2023 - Spring 2024.
Eamon "Boogie" Mikulec, Fall 2022.
Jiazheng Liu, Summer 2020.
Tianyi Yu and Zehong Zhao, Summer 2019.
Jonathan Chan, Summer 2016.
Curriculum development, Collaborative Undergraduate Research Experience (CURE), UCSD, Summer 2015. Research Experience for Undergraduates with three student participants.
Curriculum development, Collaborative Undergraduate Research Experience (CURE), UCSD, Summer 2014. Research Experience for Undergraduates with five student participants.
Jonathan Haapala, Summer 2014.

Professional Service

Editor-in-Chief, Algebraic Combinatorics (2021-present).
Managing Editor, Journal of Combinatorics (2019-present).
Journal Referee for Advances in Mathematics, Algebraic Combinatorics, Annals of Combinatorics, Australasian

Journal of Combinatorics, Combinatorial Theory, Communications in Algebra, Discrete and Computational Geometry, Discrete and Continuous Dynamical Systems - Series A, Discrete Mathematics, Electronic Journal of Combinatorics, European Journal of Combinatorics, Formal Power Series and Algebraic Combinatorics, Forum of Mathematics - Pi, Forum of Mathematics - Sigma, International Mathematics Research Notices, Involve, Journal of Algebraic Combinatorics, Journal of Combinatorial Theory - Series A, Journal of Combinatorics, Journal of Integer Sequences, Journal of the London Mathematical Society, Manuscripta Mathematica, Proceedings of the American Mathematical Society, Rocky Mountain Journal of Mathematics, Selecta Mathematica (New Series), Transactions of the American Mathematical Society.

External Evaluator for promotion cases at Arizona State University, North Carolina State University, University of Washington, Wake Forest University.

Co-organizer. RIMS Workshop on Coinvariant Theory 2025. Kyoto, Japan.

UCSD Academic Integrity Review Board (2025-present).

Reviewer for TRELS Scholarship. UCSD. (W25)

Program Committee Co-Chair, Formal Power Series and Algebraic Combinatorics 2024. Bochum, Germany.

Program Committee, Formal Power Series and Algebraic Combinatorics 2021. Ramat-Gan, Israel.

Program Committee, Formal Power Series and Algebraic Combinatorics 2017. London, UK.

Problem Mentor, Minnesota Research Workshop in Algebra & Combinatorics 2023. Minneapolis, MN.

Grant Proposal Review

NSF panelist (3 times)

Ad hoc NSF reviewer (3 proposals)

Ad hoc NSA reviewer (2 proposals)

Israel Science Foundation (2 proposals)

Marsden Fund (New Zealand) (2 proposals)

Research Grants Council of Hong Kong (3 proposals)

Austrian Academy of Sciences (1 proposal)

ANID (Chile) (2 proposals)

Served on the committee for the Advancement to Candidacy of Andy Wilson (S13), Quang Bach (S14), Michael Tait (S14), Ran Pan (F14), Luvreet Sangha (W15), Sittipong “Kuang” Thamrongpairoj (S15), Dun Qiu (S16), Geoff Ganzberger (S18), Xindong Tang (S19), Chengjie Huang (F19), Ji Zeng (F22), Erlang Surya (W23), Xiaomeng Hu (S23), Runqiu Xu (S24), Su Zhou (S26).

Served on the thesis defense committee for Andy Wilson (S15), Quang Bach (S17), Michael Tait (S16), Ran Pan (S16), Marino Romero (S19), Sittipong “Kuang” Thamrongpairoj (F19), Mozhgan Mirzei (S20), Xindong Tang (S21), Geoff Ganzberger (F21), Ji Zeng (S24) Erlang Surya (S25), Xiaomeng Hu (S25), Runqiu Xu (S26).

Opponent, Ph.D. Defense of Danai Deligeorgaki. (KTH, Sweden) June, 2025.

External Member, Ph.D. Committee for Kelvin Chan (York U., Canada) Jan. 2024.

UCSD Postdoc Hiring Committee (23-24: Chair).

UCSD Teaching Observation Committee (23-24).

Instructor, Hokkaido Summer Institute: (August 2023).

UCSD Task Force on TA Coverage (2023).

Problem Mentor, Minnesota Research Workshop in Algebra and Combinatorics (MRWAC) (May 2023).

UCSD Undergraduate Curriculum Task Force (2018).

UCSD Graduate Colloquium organizer (W19, W20).

UCSD Undergraduate Colloquium organizer (F12, F16, W18, W22, W23).

UCSD Graduate Admissions Committee (W14, W15, W16, W17, W18, W21, W22, W23, W25, W26).

UCSD Qualifying Examinations and Appeals Committee (24-25, 25-26).

UCSD Hiring Committee (18-19, 19-20).

UCSD Math Course Equivalence Committee (20-21, 21-22, 22-23, S25).

Speaker for “What’s going on in Combinatorics?” at the UCSD Graduate Open House, S13, S17.

Speaker at award banquet for the UCSD High School Honors Math Contest, S13.

San Diego Math Circle teacher, W15.