Curriculum Vitae

Sara C. Billey

April 1, 2022

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Department of Mathematics
University of Washington
Box 354350
Seattle, WA 98195-4350

Citizenship: United States

Research interests:

Algebraic combinatorics, Lie theory, computational algebraic geometry, probability and experimental mathematics: Affine Grassmannians, Schubert varieties, Schubert polynomials, flag manifolds, symmetric functions, root systems, Coxeter groups, diagonal harmonics, computer aided combinatorics, stochastic processes, complexity theory, fingerprint databases, and learning algorithms.

Education:

University of California, San Diego, Ph.D., Mathematics, June, 1994.

University of California, San Diego, M.A., Mathematics, September 1991.

Massachusetts Institute of Technology, B.S., Mathematics, June 1990.

Ph.D Thesis Advisors: Mark Haiman and Adriano Garsia

Academic positions:

University of Washington   Seattle, WA
September 2009-present
Professor of Mathematics.

University of Washington   Seattle, WA
September 2003-August 2009
Associate Professor of Mathematics.

Massachusetts Institute of Technology   Cambridge,MA
1998-2003
Assistant/Associate Professor of Applied Mathematics.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY   Cambridge,MA
January 1994-1998
Applied Mathematics Instructor and NSF Postdoctoral Fellow under the mentorship of Richard Stanley. (on leave 1995)

UNIVERSITY OF CALIFORNIA   San Diego, CA
January 1995-December 1995
Presidential Postdoctoral Fellow under the mentorship of Nolan Wallach.

Academic affiliations:

eSCIENCE INSTITUTE AT UW   Seattle, WA
March 2019-present

Grants and awards:

NSF Grant: DMS-1764012 " Combinatorial Connections with Algebra, Geometry, Probability and Applications" awarded June 2018 for three years.

UW College of Arts and Sciences Bergstrom Award for Art and Science 2018 (with Tímea Tihanyi).

Awarded the John Rainwater term faculty fellowship for 2016-2019.

Inaugural Member of the American Mathematical Society Fellows program, 2012.

NSF Grant: DMS-1101017 "Combinatorial and Algebraic Aspects of Varieties" awarded June 2011 for five years. $450,000.

Top Cited Author Award for an article published in Advances in Applied Math 2005-2010. Awarded August 2010.

NSF Grant: DMS-0754486 "REU Site: Inverse Problems for Electrical Networks" awarded 02/26/2008 for $175,632.00. (co-PI with James Morrow and William Stein)

NSF Grant: DMS-0800978 "Computational/Combinatorial Considerations In Topology, Coxeter Groups, and Representation Theory" awarded for $ 189,000.00.

Department of Mathematics Faculty Fellowship 2007-2009.

Royalty Research Grant awarded 2006.

Advance Grant awarded in 2004.

Class of 1922 Career Development Professorship awarded June 2001-2003.

Presidential Early Career Award for Scientists and Engineers (PECASE) awarded October 2000-2006 for $500,000.

List of research publications:

1. *Some Combinatorial Properties of Schubert Polynomials* (with W. Jockusch and R. Stanley) J. of Algebraic Comb. **(2) 4** (1993).

2. *RC-Graphs and Schubert polynomials.* (with N. Bergeron) Experimental Mathematics, Vol.2 (1993), No. 4.

3. *An Abstract Definition of Schubert Polynomials.* University of California, San Diego, Ph.D. thesis 1994.

4. *Schubert polynomials for the classical groups.* (with M. Haiman) J. of the AMS, Vol.8, Num. 2, April 1995.

5. *Kostant polynomials and the cohomology ring for G/B*, announcement. Proc. Natl. Acad. Sci. USA, Vol.94, pp. 29–32, January 1997.

6. *Kostant polynomials and the cohomology ring for G/B.* Duke Math. J., Vol. 96, No. 1, pp. 205-224, 1999.

7. *Transition Equations for Isotropic Flag Manifolds.* Discrete Math., Special Issue devoted to the Conference in Taormina, Sicily, in honor of Adriano Garsia, vol. 193 (1998) pp. 69–84.

8. *Vexillary elements of the hyperoctahedral group* (with Tao Kai Lam). J. of Algebraic Combinatorics, v.8 (1998) pp. 139-152.

9. *Pattern avoidance and rational smoothness of Schubert varieties.* Advances in Math, vol. 139 (1998) pp. 141–156.

10. *The parabolic map* (with C. K. Fan and J. Losonczy) J. of Algebra, vol. 214 (1999).

11. *On the Singular Locus of a Schubert Variety* (with V. Lakshmibai). Journal of the Ramanujan Mathematical Society, 15 (2000), no. 3, 155–223.

12. *Kazhdan-Lusztig Polynomials for 321-hexagon-avoiding permutations*, (with Gregory Warrington). J. of Algebraic Combinatorics, (2001) v. 13, pp. 111-136.

13. *Maximal Singular Loci of Schubert Varieties in SL_n/B* (with Gregory Warrington). Trans. AMS. v. 355 (2003) pp. 3915–3945.

14. *Lower bounds for Kazhdan-Lusztig polynomials from patterns* (with Tom Braden). Transform. Groups 8 (2003), no. 4, 321–332.

15. *A vector partition function for the multiplicities of $sl_k(C)$* (with Victor Guillemin and Etienne Rassart). Journal of Algebra 278 (2004), no. 1, 251–293.

16. *Smoothness of Schubert varieties via patterns in root subsystems* (with Alexander Postnikov). Advances in Applied Mathematics Volume 34, Issue 3 , April 2005, Pages 447-466.

17. *Intersections of Schubert varieties and other permutation array schemes* (with Ravi Vakil). IMA Volumes in Mathematics and its Applications Volume 146: Algorithms in Algebraic Geometry, 2007, pages 21–54.

18. *Flag arrangements and triangulations of products of simplices* (with Federico Ardila). Advances in Mathematics, Volume 214, Issue 2, 1 October 2007, Pages 495-524.

19. *Embedded factor patterns for Deodhar elements in Kazhdan-Lusztig theory* (with Brant Jones). Special Issue of Annals of Combinatorics dedicated to Permutation Patterns. v. 11 (2007) pp. 285-333.

20. *Affine partitions and affine Grassmannians* with Stephen Mitchell. Electronic Journal of Combinatorics, Special Issue in honor of Anders Bjorner's 60th Birthday, R18, Volume 16(2), 2009.

21. *An appendix to: Permutations with Kazhdan-Lusztig polynomial $P_{id,w}(q) = 1 + q^h$* with Jonathan Weed and included in the article by Alexander Woo. The Electronic Journal of Combinatorics Volume 16(2), 2009. Published May 12, 2009.

22. *Smoothness and palindromic Schubert varieties in Affine Grassmannians* with Stephen Mitchell. Journal of Algebraic Combinatorics (2010) 31:169-216.

23. *Rigid structures and branched polymers* joint with Dave Anderson. Manuscript. 2010.

24. *A pattern characterization of rationally smooth affine Schubert varieties of type A*, joint with Andrew Crites. J. Algebra 361 (2012), 107.

25. *Rational smoothness and affine Schubert varieties of type A,* joint with Andrew Crites. Abridged version of the paper above. Accepted for a talk at FPSAC 2011 in Reykjavik, Iceland. DMTCS Proceedings 2011. Online `http://www.dmtcs.org/dmtcs-ojs/index.php/proceedings/issue/view/119`

26. *Singularities of generalized Richardson varieties* joint with Izzet Coskun. Comm. Algebra 40 (2012), no. 4.

27. *Affine dual equivalence and k-Schur positivity* with Sami Assaf. J. Combinatorics Volume 3 (2012), Number 3, 343–399.

28. *Permutations with given peak set* with Krzysztof Burdzy and Bruce Sagan. Journal of Integer Sequences, Vol. 16 (2013), Article 13.6.1. Also available at arXiv:1209.0693.

29. *Permutation patterns and the Edelman-Greene correspondence* joint with Brendan Pawlowski. Extended abstract accepted for a talk at FPSAC 2013 in Paris, France.

30. *Permutation patterns, Stanley symmetric functions and generalized Specht modules* joint with Brendan Pawlowski. Journal of Combinatorial Theory, Series A, 2014, (124), pp 85-120.

31. *Fingerprint Databases for Theorems* joint with Bridget Tenner. Notices of the AMS. Volume 60, Number 8, September 2013, pp 1034–1039.

32. *On meteors, earthworms and WIMPs* joint with Krzysztof Burdzy, Soumik Pal and Bruce Sagan. Annals of Applied Probability, Volume 25, Number 4 (August 2015), 1729-1779.

33. *Consequences of the Lakshmibai-Sandhya Theorem: the ubiquity of permutation patterns in Schubert calculus and related geometry* joint with Hiraku Abe. Advanced Studies in Pure Mathematics, Volume 71, 2016.

34. *Coxeter-Knuth graphs and a signed Little map for type B reduced words* joint with Zachary Hamaker, Austin Roberts and Benjamin Young. Electronic J. of Combinatorics, Volume 21, Issue 4 (2014),Paper #P4.6

35. *Factoring peak polynomials* joint with Matthew Fahrbach and Alan Talmage. DMTCS Proceedings FPSAC15, 2015, 441452.

36. *Coefficients and roots of peak polynomials* joint with Matthew Fahrbach and Alan Talmage. Experimental Math, Volume 25, Issue 2, April 2016, pages 165-175.

37. *The Contributions of Stanley to the Fabric of Symmetric and Quasisymmetric Functions* with Peter McNamara. In the collection "The Mathematical Legacy of Richard P. Stanley" edited by Patricia Hersh, Thomas Lam, Pavlo Pylyavskyy, and Victor Reiner. Published by the AMS, 2016.

38. *Tanglegrams: a reduction tool for mathematical phylogenetics* with Arnold Kas, Matjaž Konvalinka and Frederick A. Matsen IV. ArXiv:1507.04784. IEEE/ACM Trans. Comput. Biol. Bioinform, volume PP,number 99, 2016.

39. *On the enumeration of tanglegrams and tangled chains* with Matjaž Konvalinka and Frederick A. Matsen IV. ArXiv: 1507.04976. J. Combin. Theory Ser. A, 146, pp 239–263, 2017.

40. *Parabolic Double Cosets* joint with Matjaž Konvalinka, Kyle Peterson, William Slofstra, Bridget Tenner. Extended abstract accepted to FPSAC2016 as a poset. arXiv:1612.00736. Electronic Journal of Combinatorics, Volume 25, Issue 1 (2018).

41. *Boolean product polynomials and Schur-positivity* joint with Louis Billera and Vasu Tewari. Extended abstract accepted to FPSAC2018 as a talk. Issue 80B Proceedings of the 30th International Conference on "Formal Power Series and Algebraic Combinatorics", July 16 - 20, 2018, Dartmouth College, Hanover, USA.

42. *A bijective proof of Macdonald's reduced word formula* joint with Alexander Holroyd and Benjamin Young. Extended abstract accepted to FPSAC2016 as a talk. arXiv:1702.02936. Algebraic Combinatorics, Volume 2 (2019) no. 2 p. 217-248

43. *Boolean product polynomials, Schur positivity, and Chern plethysm* joint with Brendon Rhoades and Vasu Tewari. 20 pages. Electronically available arXiv:1902.11165. International Mathematics Research Notices, rnz261, Nov. 2019.

44. *Pop-stack sorting and its image: permutations with overlapping runs* joint with Asinowski, Banderier, Hackl, and Linusson, Acta Math. Univ. Comenian. (N.S.) 88 (2019), no. 3, 395–402.

45. *Tableaux posets and the fake degrees of coinvariant algebras* joint with Matjaž Konvalinka and Joshua Swanson. 45 pages. Preprint arXiv: 1809.07386. Advances in Math, Volume 371, 16 September 2020.

46. *Asymptotic normality of the major index on standard tableaux* joint with Matjaž Konvalinka and Joshua Swanson. Electronically available arXiv:1905.00975. Advances in Applied Mathematics, Volume 113, 2020.

47. *Existence and hardness of conveyor belts* joint with Molly Baird, Erik D. Demaine, Martin L. Demaine, David Eppstein, Sándor Fekete, Graham Gordon, Sean Griffin, Joseph S. B. Mitchell, Josh Swanson. arXiv:1908.07668. The Electronic Journal of Combinatorics, volume 27, number 4, 2020, Article P4.25.

48. *On the distribution of the major index on standard Young tableaux* joint with Matjaž Konvalinka and Joshua Swanson. Extended abstract accepted to FPSAC2020 as a talk. Electronically available arxiv:2005.10341. Sminaire Lotharingien de Combinatoire 84B (2020) Proceedings of the 32nd Conference on FPSAC, Article #44, 12 pp.

49. *The metric space of limit laws for q-hook formulas* joint with Joshua Swanson. Submitted to Combinatorial Theory. https://arxiv.org/abs/2010.12701.

50. *A Pattern Avoidance Characterization for Smoothness of Positroid Varieties* joint with Jordan Weaver. Extended abstract accepted to FPSAC2022 as a talk.

51. *Criteria for smoothness of positroid varieties via pattern avoidance, Johnson graphs, and spirographs* joint with Jordan Weaver. In preparation.

52. *Weaving patterns for commutation classes in the affine symmetric groups* joint with Herman Chao, Ben Elias, and Kevin Liu. In preparation.

53. *On various posets for Fubini words and Ordered Set Paritions* joint with Stark Ryan. In preparation.

54. *Cyclotomic Generating Functions* joint with Joshua Swanson. In preparation.

List of book publications:

1. *Singular Loci of Schubert Varieties.* (with V. Lakshmibai) Progress in Mathematics, Birkhauser Boston, v. 182, 2000.

Sequences added to Sloane's On-Line Encyclopedia of Integer Sequences:

A058094, A061539, A061710, A144924, A165208, A180635, A180635, A223034, A223905, A224066, A224240, A224243 A224255, A224287, A224316, A224318, A246865, A258488, A258487, A258486, A300931, A318806, A331920.

Invited addresses:

FPSAC Bangalore, India (July 2022)

Spencer Lecture at Kansas State University Department of Mathematics, Fall (2021)

Northeastern University Representation Theory and Related Topics Seminar April 30, 2021.

Michigan State Combinatorics and Graph Theory Seminar, April 14, 2021.

ICERM Workshop: "Basic Schubert Calculus", Feb 1, 2021

UW Math Major Seminar, "Opportunities Beyond: Considering Graduate Studies in Math", Jan 21, 2021.

North Carolina Triangle Lectures in Combinatorics, November 14, 2020.

University of Kentucky's Discrete CATS (Combinatorics, Algebra, Topology, Statistics) Seminar, November 2, 2020.

UW Math: Current Topics Seminar, November 19, 2020.

Séminaire du LACIM, October 30, 2020.

Spring 2020, two lectures in Sweden canceled due to Covid.

Electronic Seminar in Math Education, November 19, 2019.

ALGECOM = Algebra, Combinatorics and Geometry, Washington University in St. Louis, September 29, 2019.

Garsia Fest June 2019, plenary speaker.

Art and Mathematics: Tactile Math Patterns in Clay, Mathday 2019

Asymptotic Algebraic Combinatorics at BIRS March 10-15, 2019.

Combinatorics and beyond: the many facets of Sergey Fomin's mathematics, November 2018.

Invited speaker ICM 2018 Satellite Meeting: A Pan-Hemispheric Celebration of Mathematics in Miami, session on Combinatorics

Formal Power Series and Algebraic Combinatorics (FPSAC), 2018. Extended abstract selected for a talk. Joint with Billera and Tewari.

Plenary speaker at the annual Permutation Patterns Conference July 2018.

Plenary speaker at "The 6th Encuentro Colombiano de Combinatoria (ECCO 2018) June 5, 2018.

Ohio State University Workshop on Schubert Calculus, May 9 - 12, 2018

Mathday March 2018: "Bitcoin, Blockchain, and the Boogeyman Behind it".

Invited speaker Schubert Calculus, in Guangzhou, China. Nov 6-10, 2017.

Colloquium, University of California at Davis, Jan. 30, 2018.

Colloquium, University of Oregon, May 30, 2017

Invited speaker at "Algebraic and Geometric Combinatorics of Reflection Groups" in Montreal, June 5-9, 2017.

Invited speaker Mid-Atlantic Algebra, Geometry, and Combinatorics (MAAGC) Workshop, May 7, 2017.

Plenary Speaker "Graduate Students in Combinatorics Conference" (GSCC), University of Kansas, April 8, 2017.

Mathday March 2017: "Deciphering Big Data Predictions"

Colloquium at University of Southern California, January 25, 2017.

Invited speaker "Algebraic Combinatorics and Group Actions Conference", July 2016 in Herstmonceux England.

Invited address for the annual "Mathematics Across the Cannon" event, co-sponsored by St. Olaf and Carleton Colleges in Northfield, Minnesota. April 28, 2016

Invited speaker at a session of the AMS Spring Western Sectional Meeting of the AMS, April 9, 2016.

Seminar speaker at Tulane University, March 1, 2016 Invited speaker for the Louisiana State University Student Colloquium, February 29, 2016.

Invited speaker at the special session at the AMS/MAA Joint meetings entitled "Commutative Algebra". January 2016.

Invited speaker at 31st BAD* Math Day (Bay Area Discrete Mathematics Day) San Francisco State University Saturday October 17, 2015

Invited speaker Discrete Mathematics Day At WPI September, 12, 2015.

Invited Speaker at BIRS weekend workshop on "Positivity in Algebraic Combinatorics" August 15-16, 2015.

Poster presentation FPSAC 2015 at KAIST in Daejeon South Korea, July 6-10, 2015.

Colloquium speaker at Ohio State University, March 26, 2015.

Plenary Speaker for Mathday 2015, University of Washington.

Invited speaker at Wachfest January 2015, Miami Florida.

Invited speaker at Neil Sloane's birthday conference entitled "Sloane75fest: Challenges of Identifying Integer Sequences" October 9-10, 2014.

AMS-MAA Invited Lecture at MathFest 2014, August 79, 2014, in Portland, Oregon. "What is the value of a computer proof in research and teaching?"

Invited lecturer in a 4-part series at "The 4th Encuentro Colombiano de Combinatoria (ECCO 2014). June 9-16, 2014, Bogat/'a, Colombia, Topic: "Quasisymmetric functions".

Colloquium at U.Illinois on March 13, 2014.

Combinatorics Seminar at University of California, Berkeley, Feb. 3, 2014.

Invited speaker for "Lie Groups, Lie Algebras and their Representations" workshop. Feb. 1-2, 2014 at Stanford University.

Invited speaker for special session "Geometric Applications of Algebraic Combinatorics" Jan 16-19, 2014 at AMS-MAA Joint Meeting in Baltimore.

UMASS, Amherst, Representation Theory Seminar February 14, 2013.

MIT, Combinatorics Seminar February 15, 2013.

Invited speaker for Sage Days 45: Multiple Dirichlet Series, Combinatorics, and Representation Theory (February 11 - 15, 2013) "Pattern avoidance in permutations with applications to symmetric functions".

Lightning talk at Reproducibility in Computational and Experimental Mathematics (December 10-14, 2012) "Canonical Representation of Theorems"

The 5th Mathematical Society of Japan Seasonal Institute, 2012 International summer school and conference on Schubert calculus. Invited to give 4 lectures. July 17-27.

Plenary speaker at Nebraska Conference for Undergradate Women, Jan 27-29, 2012.

Invited speaker for special session "Geometry and Combinatorics in Flag Manifolds and Beyond for the AWM 40-year anniversary conference. September 17-18, 2011 at Brown University.

Plenary Speaker for CanaDAM 2011, June 1-4, 2011. Victoria.

Institute for Defense Analysis, San Diego. Talk. December 2010

Winter CMS Meeting invited speaker in special session on "Discrete Mathematics." Vancouver 4-6 December 2010.

University of Kentucky, invited speaker at "Combinatorics 2010: Advances, Trends and Speculations" March 26, 2010.

AIM invited speaker at the "Equivariant cohomology and Localization" Workshop 3-15-2010 -3-19-2010.

University of Kansas, Combinatorics Seminar, January 2010.

UW Algebra Seminar June 3, 2009.

MIT, Combinatorics Seminar May 6, 2009.

MSRI January 2009.

University of California, Santa Barbara colloquium, May 2008.

AMS Special Session on "Applications of Computer Algebra in Enumerative and Algebraic Combinatorics" in San Diego at joint meetings, January, 2008.

AMS Special Session on "Invariants of Lie Group Actions and Their Quotients" at Rutgers, October 2007.

University of North Carolina, two talks Colloquium and Lie Theory Seminar, September 2007.

IMA workshop entitled "What is Algebraic Geometry" in Minneapolis on April 13-14, 2007

University of Michigan, Combinatorics Seminar, February 2007.

Lusztig's 60th Birthday Conference held in Cambridge, MA, June 2006.

AMS-IMS-SIAM Joint Summer Research Conference on "Integer points in Polyhedra. Geometry, Number Theory, Representation Theory, Algebra, Optimization, Statistics" June 11-15, 2006 in Snowbird, Utah.

Summer Institute in Algebraic Geometry held at the University of Washington, August, 2005.

Formal Power Series and Algebraic Combinatorics (FPSAC), subsection devoted to Adriano Garsia June 2005.

University of British Columbia, Colloquium, March 2005.

University of California, Berkeley Colloquium, February 2005.

University of California, Davis, Combinatorics Seminar, November 2004.

Invited address AMS Fall Western Section Meeting, Albuquerque, NM, October 2004.

Richard Stanley's 60th Birthday Conference, June 2004.

Formal Power Series and Algebraic Combinatorics (FPSAC) June 2004.

Summer Institute in Mathematics at UW July 2003-2006..

Mathday at University of Washington, March 2003, 2004, 2005.

Current Problems Seminar, University of Washington, October 2003, 2005.

Western Algebraic Geometry Seminar (WAGS), Bellingham, WA, November 2002.

AMS, Meeting in San Diego, January 2002, Special Session on The Theory and Applications of Symmetric Functions,

Northeastern Seminar December 2001

University of Wisconsin, (two talks) Colloquium and Lie Theory seminars, November 2001.

University of Michigan, Combinatorics Seminar October 2001.

Valley Discrete Math Day, October 2001.

Cornell University, September 2001.

Brandeis University, Fellowship of the ring, May 2001.

Massachusetts Institute of Technology, combinatorics seminar April 2001.

AMS, Central Section Meeting in Toronto, Canada on "Modern Schubert Calculus", September 22-24, 2000.

Classical Combinatorics: In Honor of Dominique Foata's 65th birthday, at Temple University, Philadelphia, July 7-9, 2000.

Combinatorics Seminar at UCSD, February 22, 2000.

University of Pennsylvania, Mathematics Colloquium, October 13, 1999.

Moore Instructor's Conference at MIT, October 9, 1999.

City University of Hong Kong, Combinatorics Seminar June 2, 1999.

Tamkang University, Tamsui, Taiwan. Combinatorics Seminar May 27, 1999.

Princeton University, Representation Theory and Combinatorics seminar. April 15, 1999.

AMS special session on Geometry and Lie Groups, Tucson Arizona, November 13-15, 1998

Conference on Algebraic Combinatorics and Applications, Oakland University, Rochester, Michigan. May 1-3, 1998

AMS special session on Algebraic Combinatorics, Louisville Kentucky, March 20 - 21, 1998

George Washington University combinatorics seminar, July 1997.

Oberwolfach session on Schubert Varieties, April 1997.

AMS special session on Algebraic Combinatorics, San Diego, January 1997.

MSRI during the Posets and Enumerative Combinatorics Workshop, October 1996.

Massachusetts Institute of Technology, combinatorics seminar October 1996.

Massachusetts Institute of Technology, combinatorics seminar May 1996.

Thurnau Germany, Summer School on Degeneracy Loci and Schubert Varieties, June 1995.

California Institute of Technology, combinatorics seminar April 1995.

University of California San Diego, combinatorics seminar April 1995.

Smith College Regional Conference, December 1994.

Massachusetts Institute of Technology, combinatorics seminar November 1994.

Northeastern University, September 1994.

Conference in Honor of Adriano Garsia, Taormina, Sicily, July 1994.

University of Chicago, algebraic geometry seminar May 1994.

S.I.A.M. minisymposium on Algebraic Combinatorics, Philadelphia, July 1993.

Smith College Regional Conference, December 1992.

Conferences and Workshops Organized:

INSTITUT MITTAG-LEFFLER
Co-organizing a semester on "ALGEBRAIC AND ENUMERATIVE COMBINA-TORICS" 13 January - 30 April 2020 along with Petter Brändén, Sylvie Corteel, and Svante Linusson. Online workshop "Algebraic Combinatorics Online Workship (ACOW)" co-organizer and owner of the associated youtube channel

https://www.youtube.com/channel/UC6dE43qlOZ8KIDORSkLi2Ug. 600+ registered participants.

Formal Power Series and Algebraic Combinatorics (FPSAC)
Emergency online organzier for 2020 due to Covid and owner of the associated youtube channel https://www.youtube.com/channel/UChtpRYCgslPgQczOB4GGIBg/videos. 1200+ participants. Program committee co-chair along with Günter Ziegler and Marko Petkovšek for 2019 in Slovenia.
Program committee co-chair along with Victor Reiner for FPSAC 2010 in San Francisco, USA.

Garsiafest: Future Directions in Algebraic Combinatorics Conference in Honor of Adriano Garsia's 90th Birthday, June 17-20, 2019
Co-organizer.

6th Encuentro Colombiano de Combinatoria (ECCO) 2018
Member of the scientific committee with Carolina Benedetti, Felipe Rincn, Bernd Sturmfels.

1st Pacific Northwest Combinatorics Day, March 31, 2018
Co-organizer with Philippe Nadeau and Marni Mishna of a 1 day mini-conference at UW.

Mathfest
Co-organized an invited session entitled "Computational Aspects of Algebra, Geometry and Combinatorics" at Mathfest, August 2014.

ICERM = Institute for Computational and Experimental Research in Mathematics
Co-organized a workshop entitled "Whittaker Functions, Schubert calculus and Crystals" with Dan Bump and Cristian Lenart (March 4-8, 2013).

ICERM = Institute for Computational and Experimental Research in Mathematics
Co-organizing a semester entitled "Automorphic forms, combinatorial representation theory, and multiple Dirichlet series" with Dan Bump, Ben Brubaker, Gautam Chinta, Dorian Goldfeld, Solomon Friedberg, Jeff Hoffstein, Anne Schilling, and Nicolas Thiery. Spring 2013.

AMS 2012 Spring Western Section Meeting
Co-organizing a session entitled "Algebraic Combinatorics" Honolulu, HI, March 2012, with Federico Ardila, Kelli Talaska, and Lauren Williams

BANFF INTERNATIONAL RESEARCH STATION
Co-organized a workshop entitled "Quasisymmetric Functions" with Lou Billera and Richard Stanley in November 2010.

AMS 2008 FALL WESTERN SECTION MEETING
Co-organizing a session entitled "Combinatorial Representation Theory" Vancouver, CA, October 2008 with Stephanie van Willigenburg and Alexander Kleshchev.

AMS WESTERN SECTION MEETING
Co-organized a session entitled "Algebraic Combinatorics and Geometry," Eugene Oregon, Nov. 2005 with Mark Haiman.

BANFF INTERNATIONAL RESEARCH STATION
Co-organized a workshop entitled "Recent advances in algebraic combinatorics" with Ian Goulden, Curtis Greene, David Jackson, Richard Stanley in May 2003.

Other professional activities:

CHAIR OF THE ADMISSIONS COMMITTEE
Math Department, University of Washington 2020-present.

PACIFIC INSTITUTE FOR THE MATHEMATICAL SCIENCES (PIMS) SCIENTIFIC REVIEW PANEL MEMBER/CHAIR
August 2019 - present

THE COMBINATORICS CONSORTIUM
Presidet 2021-present. A nonprofit organization for the promotion of conferences and publication of diamond open access journals in combinatorics.

ALGEBRAIC COMBINATORICS
Associate Editor of the Journal, 2019-present. Coauthor on the constitution. Chair of the Steering Committee 2020-2022.

AMERICAN MATHEMATICAL SOCIETY
Member at Large on the Council, 2005-2008,
Prize Selection Committee, 2015,
Western Section Program Committee, 2014-2016.

ASSOCIATION OF WOMEN IN MATHEMATICS
faculty sponsor for the UW student chapter, 2015-2019,
Policy and Advocacy Committee, fall 2015 - 2019.

CENTER FOR COMMUNICATIONS RESEARCH, SAN DIEGO
Consulting/Focus Board Member, 2011-2014.

CENTER FOR COMMUNICATIONS RESEARCH Summers 1994 and 1996.
Research consultant during SCAMP.

ADVANCES IN MATHEMATICS
Editor, 2004-2016.

JOURNAL OF COMBINATORICS
Editor, 2010-present.

ALGEBRAIC COMBINATORICS
Editor, 2018-present.

ANNALS OF COMBINATORICS
Editor, 2019-present.

COMBINATORICS SEMINAR ORGANIZER
At MIT from 1996-2002. At UW from 2003-present with Isabella Novik. Owner
of the associated youtube channel `https://www.youtube.com/channel/UCNuW3bW4_`
`LqE0dmQYWE-Jkg/videos`.

UW/PACIFIC SCIENCE CENTER ADVISORY FACULTY TEAM March 2005- 2015.

INDO-U.S. FRONTIERS OF SCIENCE SYMPOSIUM Sponsored by the National
Academy of Science, held January 9-11,2004 in Bangalore India.

FORMAL POWER SERIES AND ALGEBRAIC COMBINATORICS
Program committee member, 1998, 2001, 2005.

NATIONAL SCIENCE FOUNDATION
Reviewer and panel member 2000,2002,2003,2007, 2009, 2010, 2017, 2019.

NATIONAL PHYSICAL SCIENCE CONSORTIUM January, 2002-present
Mentor.

IBM - CAMBRIDGE RESEARCH CENTER Summers of 90 and 91.
Programming for a statistical software package.

Postdoctoral Advisees:

Federico Ardila (2005), David Anderson (2009-2012), Andrew Berget (2011-2014), Vasu Tewari (2015-2018), Jake Levinson (2017-2020).

PhD Thesis students:

1. Gregory Warrington (Harvard University), Ph.D 2001.

2. Etienne Rassart (MIT), Ph.D March, 2004.

3. Brant Jones (University of Washington), Ph.D. May 2007.

4. Beth Kelly (University of Washington), Ph.D. August 2007.

5. Kurt Luoto (University of Washington), Ph.D June 2009.

6. Andrew Crites (University of Washington), Ph.D June 2011.

7. Brendan Pawlowski (University of Washington), Ph.D July 2014.

8. Austin Roberts (University of Washington), Ph.D June 2014.

9. Jair Taylor (University of Washington), Ph.D June 2016.

10. Joshua Swanson (University of Washington), Ph.D June 2018.

11. Connor Ahlbach (University of Washington), Ph.D June 2019.

12. Graham Gordon (University of Washington), Ph.D June 2020.

13. Sean Griffin (University of Washington), Ph.D June 2020.

14. Stark Ledbetter (University of Washington), Ph.D expected June 2022.

15. Jordan Weaver (University of Washington), Ph.D expected December 2022.

16. Kevin Liu (University of Washington), Ph.D expected June 2023.

17. Herman Chao (University of Washington), Ph.D expected June 2025.

Master's Thesis students:

1. Tao Tran (MIT) Master's thesis August 2003.

2. Mary Solbrig (University of Washington), Master's thesis August 2013.

3. Anh Huynh (University of Washington), Master's thesis December 2013.

4. Debra Matthews (University of Washington), Master's thesis June 2016.

5. Sharat Chandra (University of Washington), Master's thesis June 2019.

6. Eli Johnson (University of Washington), Master's thesis June 2019.

Undergraduate Thesis students:

1. Ruth Davidson (University of Washington), Undergraduate thesis December 2008.

2. Henry Kvinge (University of Washington), Undergraduate thesis March 2010.

3. Natalie Hobson (University of Washington), Undergraduate thesis March 2012.

4. Patrick Lenning (University of Washington), Undergraduate thesis June 2015.

5. Mark Bennett (University of Washington), Undergraduate thesis June 2016.

Undergraduate research students: (56 people)

Cosmo Wang, Feiyang Liu (2019), James Pedersen (WXML 2019), Justin Shyi, Jesse Rivera, Thomas Browning (WXML 2018) Irena Chen , Jessica Fay, and Melissa Stadt (2016-2017) Aaron Bode, Kimberly Bautista, Dien Dang, Nicholas Farn, Graham Kelly, Sha (Stanley) Lai, Adharsh Ranganathan, Michael Trinh, Alex Tsun, Katrina Warner (2016-2017, WXML Graphletes) Mark Bennett (2015-16) Patrick Lenning (2014-2015) Matthew Fahrbach and Alan Talmage (2013-2014) Lee Spires, Natalie Hobson, Kun Ling (2011-12) Adam Mosher (2010), Eva Fornaeus, Alexander Leaf, Hannah Manuel, John Pardo, and Zhen Wei (REU 2010) Henry Kvinge (2009-2010), Ruth Davidson (2008-2009), Chris Fox and Morgan Eichwald (2009), Jonathan Weed (2008), Kristen Boreman and Catherine Porter (2007), Tom Boothby, Sean Howe and Emily Kirkman, (2007) Richard Kelley (2005), Abinav Kumar (2001), Sarah Kolitz (2001), Dug Eichelberger (2001), Mike Walsh(2000), Edward Early (1999), Ephrem Paredes (1998), Anna Khasin (1997), Jessica Maia (1997), Jorge Rodriguez (1997), Jan Skotheim (1997), Lynn Mirales (1996), Matthew Berman (1996), Gillian Bidgood (1996), Anna Khasin (1996).