Matthias Beck

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San Francisco State University
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Current Positions

Professor, San Francisco State University.

Associate Chair of Mathematics, San Francisco State University.

Previous Positions

Gastprofessor, Freie Universität Berlin, Fall 2019 – Summer 2021.

Visiting Professor, Vassar College, Spring 2015.

Gastprofessor, Freie Universität Berlin, October–December 2014.

Visiting Scholar, Cornell University, August–September 2014.

Professeur invité, Université d'Evry Val d'Essonne, May 2012.

Associate Professor, San Francisco State University, Fall 2009 – Spring 2013.

Member, Mathematical Sciences Research Institute, Berkeley, Spring 2008.

Assistant Professor, San Francisco State University, Fall 2004 – Spring 2009.

Member, Max-Planck-Institut für Mathematik, Bonn, Spring/Summer 2004.

Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley, Fall 2003.

Robert Riley Assistant Professor, Binghamton University (SUNY), Fall 2000 – Spring 2003.

Education

Ph.D. Mathematics, Temple University, August 2000.
Advisor: S. Robins, dissertation: *The arithmetic of rational polytopes*.

Diplom Mathematics, minor Physics, Universität Würzburg, Germany, July 1997.
Advisor: G. Köhler, Diplomarbeit: *Number theoretical algorithms using elliptic curves*.

Staatsexamen Mathematics and Physics (Secondary Education), Universität Würzburg, Germany, June 1997.

Research

Books:

[1] M. Beck and S. Robins, Computing the Continuous Discretely: Integer-point Enumeration in Polyhedra. *Springer Undergraduate Texts in Mathematics*, 2007 (1st edition) & 2015 (2nd edition). German translation (by K. Eickmeyer), *Springer*, 2008; Japanese translation (by Y. Okamoto), *Springer*, 2010.

[2] M. Beck and R. Geoghegan, The Art of Proof: Basic Training for Deeper Mathematics, *Springer Undergraduate Texts in Mathematics*, 2010.

[3] M. Beck, G. Marchesi, D. Pixton, and L. Sabalka, A First Course in Complex Analysis, open textbook (print version published by *Orthogonal Publishing*), 2002–2018.

[4] M. Beck and R. Sanyal, Combinatorial Reciprocity Theorems, *AMS Graduate Studies in Mathematics*, 2018.

Edited Volumes:

[1] A. Barvinok, M. Beck, C. Haase, B. Reznick, and V. Welker, eds. Integer Points in Polyhedra. Geometry, Number Theory, Algebra, Optimization. Proceedings of the AMS-IMS-SIAM Joint Summer Research Conference in Snowbird, Utah (July 2003).
Contemporary Mathematics **374**, American Mathematical Society, 2005.

[2] M. Beck, C. Haase, B. Reznick, M. Vergne, V. Welker, and R. Yoshida, eds. Integer Points in Polyhedra. Proceedings of the AMS-IMS-SIAM Joint Summer Research Conference in Snowbird, Utah (June 2006).
Contemporary Mathematics **452**, American Mathematical Society, 2008.

Papers:

[1] M. Beck, The reciprocity law for Dedekind sums via the constant Ehrhart coefficient, *American Mathematical Monthly* **106**, no. 5 (1999), 459–462.

[2] M. Beck, A closer look at lattice points in rational simplices, *Electronic Journal of Combinatorics* **6**, no. 1 (1999), R 37 (9 pages).

[3] M. Beck, Counting lattice points by means of the residue theorem, *Ramanujan Journal* **4**, no. 3 (2000), 299–310.

[4] M. Beck, I. M. Gessel, and T. Komatsu, The polynomial part of a restricted partition function related to the Frobenius problem, *Electronic Journal of Combinatorics* **8**, no. 1 (2001), N 7 (5 pages).

[5] M. Beck, Multidimensional Ehrhart reciprocity, *Journal of Combinatorial Theory Series A* **97**, no. 1 (2002), 187–194.

[6] M. Beck and S. Robins, Explicit and efficient formulas for the lattice point count inside rational polygons, *Discrete & Computational Geometry* **27** (2002), 443–459.

[7] M. Beck and T. Zaslavsky, A shorter, simpler, stronger proof of the Meshalkin–Hochberg–Hirsch bounds on componentwise antichains, *Journal of Combinatorial Theory Series A* **100** (2002), 196–199.

[8] M. Beck, R. Diaz, and S. Robins, The Frobenius problem, rational polytopes, and Fourier–Dedekind sums, *Journal of Number Theory* **96** (2002), 1–21.

[9] M. Beck and T. Zaslavsky, A Meshalkin theorem for projective geometries, *Journal of Combinatorial Theory Series A* **102** (2003), 433–441.

[10] M. Beck, Dedekind cotangent sums, *Acta Arithmetica* **109**, no. 2 (2003), 109–130.

[11] M. Beck, M. Cohen, J. Cuomo, and P. Gribelyuk, The number of "magic" squares, cubes, and hypercubes, *American Mathematical Monthly* **110**, no. 8 (2003), 707–717.

[12] M. Beck, D. Einstein, and S. Zacks, Some experimental results on the Frobenius problem, *Experimental Mathematics* **12**, no. 3 (2003), 263–269.

[13] M. Beck and D. Pixton, The Ehrhart polynomial of the Birkhoff polytope, *Discrete & Computational Geometry* **30**, no. 4 (2003), 623–637.

[14] M. Beck and S. Robins, A formula related to the Frobenius problem in two dimensions, *Number Theory. New York Seminar 2003* (D. Chudnovsky, G. Chudnovsky, M. Nathanson, eds.), pp. 17–23. Springer, Berlin, 2004.

[15] M. Beck and S. Zacks, Refined upper bounds for the linear Diophantine problem of Frobenius, *Advances in Applied Mathematics* **32**, no. 3 (2004), 454–467.

[16] M. Beck and S. Robins, Dedekind sums: a combinatorial-geometric viewpoint, *Unusual Applications of Number Theory* (M. Nathanson, ed.), *DIMACS Series in Discrete Mathematics and Theoretical Computer Science* **64** (2004), 25–35.

[17] M. Beck, The partial-fractions method for counting solutions to integral linear systems, *Discrete & Computational Geometry* **32** (2004), 437–446 (special issue in honor of Louis Billera).

[18] M. Beck, J. A. Deloera, M. Develin, J. Pfeifle, and R. P. Stanley, Coefficients and roots of Ehrhart polynomials, *Contemporary Mathematics* **374** (2005), 15–36.

[19] M. Beck, B. Chen, L. Fukshansky, C. Haase, A. Knutson, B. Reznick, S. Robins, and A. Schuermann, Problems from the Cottonwood Room, *Contemporary Mathematics* **374** (2005), 179–191.

[20] M. Beck, B. C. Berndt, O-Y. Chan, and A. Zaharescu, Determinations of analogues of Gauss sums and other trigonometric sums, *International Journal of Number Theory* **1**, no. 3 (2005), 333–356.

[21] M. Beck, S. Robins, and S. Zacks, Higher-dimensional Dedekind sums and their bounds arising from the discrete diagonal of the n-cube, *Advances in Applied Mathematics* **36**, no. 1 (2006), 1–29.

[22] M. Beck, X. Wang, and T. Zaslavsky, A unifying generalization of Sperner's theorem, *More Sets, Graphs and Numbers: A Salute to Vera Sos and Andras Hajnal* (E. Gyari, G. O. H. Katona, and L. Lovasz, eds.), *Bolyai Society Mathematical Studies* **15**, pp. 9–24. Springer, Berlin, and Janos Bolyai Mathematical Society, Budapest, 2006.

[23] M. W. Baldoni, M. Beck, C. Cochet, and M. Vergne, Volume computation for polytopes and partition functions for classical root systems, *Discrete & Computational Geometry* **35** (2006), 551–595.

[24] M. Beck and S. Hoşten, Cyclotomic polytopes and growth series of cyclotomic lattices, *Mathematical Research Letters* **13**, no. 4 (2006), 607–622.

[25] M. Beck and T. Zaslavsky, Inside-out polytopes, *Advances in Mathematics* **205**, no. 1 (2006), 134–162.

[26] M. Beck and T. Zaslavsky, The number of nowhere-zero flows in graphs and signed graphs, *Journal of Combinatorial Theory Series B* **96**, no. 6 (2006), 901–918.

[27] M. Beck and T. Zaslavsky, An enumerative geometry for magic and magilatin labellings, *Annals of Combinatorics* **10**, no. 4 (2006), 395–413.

[28] M. Beck, Geometric proofs of polynomial reciprocity laws of Carlitz, Berndt, and Dieter, *Diophantine analysis and related fields 2006*, pp. 11–18, Sem. Math. Sci. 35, Keio University, Yokohama, 2006.

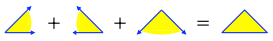
[29] M. Beck and F. Sottile, Irrational proofs for three theorems of Stanley, *European Journal of Combinatorics* **28**, no. 1 (2007), 403–409.

[30] M. Beck, S. Sam, and K. Woods, Maximal periods of (Ehrhart) quasi-polynomials, *Journal of Combinatorial Theory Series A* **115**, no. 3 (2008), 517–525.

[31] M. Beck, B. Nill, B. Reznick, C. Savage, I. Soprunov, and Z. Xu, Let me tell you my favorite lattice-point problem..., *Contemporary Mathematics* **452** (2008), 179–187.

[32] M. Beck, C. Haase, and A. Matthews, Dedekind–Carlitz polynomials as lattice-point enumerators in rational polyhedra, *Mathematische Annalen* **341**, no. 4 (2008), 945–961.

[33] M. Beck, How to change coins, M&M's, or chicken nuggets: The linear Diophantine problem of Frobenius, *Resources for Teaching Discrete Mathematics: Classroom Projects, History Modules, and Articles* (B. Hopkins, ed.), pp. 65–74. Mathematical Association of America, 2009.

[34] M. Beck, C. Haase, and F. Sottile,  *Mathematical Intelligencer* **31**, no. 1 (2009), 9–17.

[35] M. Beck, C. Haase, and S. Sam, Grid graphs, Gorenstein polytopes, and domino stackings, *Graphs and Combinatorics* **25**, no. 4 (2009), 409–426.

[36] M. Beck and A. Stapledon, On the log-concavity of Hilbert series of Veronese subrings and Ehrhart series, *Mathematische Zeitschrift* **264**, no. 1 (2010), 195–207.

[37] M. Beck and M. Halloran, Finite trigonometric character sums via discrete Fourier analysis, *International Journal of Number Theory* **6**, no. 1 (2010), 51–67.

[38] M. Beck and T. Zaslavsky, Six little squares and how their numbers grow, *Journal of Integer Sequences* **13** (2010), 10.6.2 (45 pages).

[39] M. Beck, S. Robins, and S. Sam, Positivity theorems for solid-angle polynomials, *Beiträge zur Algebra und Geometrie* **51**, no. 2 (2010), 493–507. Corrigendum in *Beiträge zur Algebra und Geometrie* **56**, no. 2 (2015), 775–776.

[40] M. Beck, I. Gessel, S. Lee, and C. Savage, Symmetrically constrained compositions, *Ramanujan Journal* **23** (2010), 355–369.

[41] M. Beck and A. Van Herick, Enumeration of 4×4 magic squares, *Mathematics of Computation* **80** (2011), 617–621.

[42] F. Ardila, M. Beck, S. Hoşten, J. Pfeifle, and K. Seashore, Root polytopes and growth series of root lattices, *SIAM Journal on Discrete Mathematics* **25** (2011), 360–378.

[43] M. Beck and C. Kifer, An extreme family of generalized Frobenius numbers, *Integers: the Electronic Journal of Combinatorial Number Theory* **11** (2011), A 24 (6 pages).

[44] M. Beck and A. Chavez, Bernoulli–Dedekind sums, *Acta Arithmetica* **149** (2011), 65–82.

[45] M. Beck, B. Braun, Nowhere-harmonic colorings of graphs, *Proceedings of the American Mathematical Society* **140** (2012), 47–63.

[46] M. Beck, Combinatorial reciprocity theorems, *Jahresbericht der DMV* **114**, no. 1 (2012), 3–22.

[47] M. Beck, T. Bogart, and T. Pham, Enumeration of Golomb rulers and acyclic orientations of mixed graphs, *Electronic Journal of Combinatorics* **19**, no. 3 (2012), P42 (13 pages).

[48] M. Beck and Y. Kemper, Flows on simplicial complexes, *Discrete Mathematics & Theoretical Computer Science* Proc. AR (2012), 817–826 (Proceedings of FPSAC'12).

[49] M. Beck, B. Braun, and N. Le, Mahonian partition identities via polyhedral geometry, *From Fourier Analysis and Number Theory to Radon Transforms and Geometry: In Memory of Leon Ehrenpreis* (H. Farkas, R. Gunning, M. Knopp, and B. A. Taylor, eds.), *Developments in Mathematics* **28** (2013), 41–54.

[50] M. Beck, P. Jayawant, and T. McAllister, Lattice-point generating functions for free sums of convex sets, *Journal of Combinatorial Theory Series A* **120** (2013), 1246–1262.

[51] M. Beck and B. Braun, Euler–Mahonian statistics via polyhedral geometry, *Advances in Mathematics* **244** (2013), 925–954.

[52] M. Beck, J. De Silva, G. Dorfsman–Hopkins, J. Pruitt, and A. Ruiz, The combinatorics of interval-vector polytopes, *Electronic Journal of Combinatorics* **20**, no. 3 (2013), P22 (12 pages).

[53] M. Beck, T. Bliem, B. Braun, and C. Savage, Lattice point generating functions and symmetric cones, *Journal of Algebraic Combinatorics* **38**, no. 3 (2013), 543–566.

[54] M. Beck, F. Breuer, L. Godkin, and J. Martin, Enumerating colorings, tensions and flows in cell complexes, *Journal of Combinatorial Theory Series A* **122** (2014), 82–106.

[55] M. Beck and F. Kohl, Rademacher–Carlitz polynomials, *Acta Arithmetica* **163** (2014), 379–393.

[56] A. Bayad and M. Beck, Relations for Bernoulli–Barnes numbers and Barnes zeta functions, *International Journal of Number Theory* **10** (2014), 1321–1335.

[57] M. Beck, A. Cuyjet, G. R. Kirby, M. Stubblefield, and M. Young, Nowhere-zero **k**-flows on graphs, *Annals of Combinatorics* **18**, no. 4 (2014), 579–583.

[58] M. Beck, D. Blado, J. Crawford, T. Jean–Louis, and M. Young, On weak chromatic polynomials of mixed graphs, *Graphs and Combinatorics* **31**, no. 1 (2015), 91–98.

[59] M. Beck and N. Robbins, Variations on a generating-function theme: Enumerating compositions with parts avoiding an arithmetic sequence, *American Mathematical Monthly* **122**, no. 3 (2015), 256–263.

[60] M. Beck, B. Braun, M. Köppe, C. Savage, and Z. Zafeirakopoulos, s-Lecture hall partitions, self-reciprocal polynomials, and Gorenstein cones, *Ramanujan Journal* **36** (2015), no. 1-2, 123–147.

[61] M. Beck, J. Delgado, J. Gubeladze, and M. Michałek, Very ample and Koszul segmental fibers, *Journal of Algebraic Combinatorics* **42** (2015), no. 1, 165–182.

[62] M. Beck, M. Dairyko, C. Rodriguez, A. Ruiz, and S. Veeneman, Parking functions, Shi arrangements, and mixed graphs, *American Mathematical Monthly* **122**, no. 7 (2015), 660–673.

[63] G. Andrews, M. Beck, and N. Robbins, Partitions with fixed differences between largest and smallest parts, *Proceedings of the American Mathematical Society* **143**, no. 10 (2015), 4283–4289.

[64] M. Beck and M. Hardin, A bivariate chromatic polynomial for signed graphs, *Graphs and Combinatorics* **31**, no. 5 (2015), 1211–1221.

[65] M. Beck, E. Meza, B. Nevarez, A. Shine, and M. Young, The chromatic polynomials of signed Petersen graphs, *Involve* **8**, no. 5 (2015), 825–831.

[66] M. Beck, B. Braun, M. Köppe, C. Savage, and Z. Zafeirakopoulos, Generating functions and triangulations for lecture hall cones, *SIAM Journal on Discrete Mathematics* **30**, no. 3 (2016), 1470–1479.

[67] M. Beck, Stanley's major contributions to Ehrhart theory, *The Mathematical Legacy of Richard P. Stanley* (P. Hersh, T. Lam, P. Pylyavskyy and V. Reiner, eds.), AMS, 2016, pp. 53–63.

[68] M. Beck and M. Farahmand, Partially magic labelings and the Antimagic Graph Conjecture, *Séminaire Lotharingien de Combinatoire* **78B** (2017), Article 86, 11 pp. (FPSAC'17 Proceedings).

[69] J. Auli, A. Bayad, and M. Beck, Reciprocity theorems for Bettin–Conrey sums, *Acta Arithmetica* **181**, no. 4 (2017), 297–319.

[70] M. Beck, K. Jochemko, and E. McCullough, h^*-polynomials of zonotopes, *Transactions of the American Mathematical Society* **371**, no. 3 (2019), 2021–2042.

[71] M. Beck, S. Hoşten, and M. Schymura, Lonely runner polyhedra, *Integers: the Electronic Journal of Combinatorial Number Theory* **19** (2019), A 29 (13 pages).

[72] M. Beck, C. Haase, A. Higashitani, J. Hofscheier, K. Jochemko, L. Katthän, and M. Michałek, Smooth centrally symmetric polytopes in dimension 3 are IDP, *Annals of Combinatorics* **23** (2019), 255–262.

[73] L. Bardomero and M. Beck, Frobenius coin-exchange generating functions, *American Mathematical Monthly* **127**, no. 4 (2020), 308–315.

[74] M. Beck, M. Farahmand, G. Karunaratne, and S. Zuniga-Ruiz, Bivariate order polynomials, *Graphs and Combinatorics* **36** (2020), 921–931.

[75] F. Ardila, M. Beck, and J. McWhirter, The arithmetic of Coxeter permutahedra, *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales* **44**, no. 173 (2020), 1152–1166.

[76] M. Beck, P. E. Gunnells, and E. Materov, Weighted lattice point sums in lattice polytopes, unifying Dehn–Sommerville and Ehrhart–Macdonald, *Discrete & Computational Geometry* **65**, no. 2 (2021), 365–384.

[77] M. Beck and E. Leon, Binomial inequalities for chromatic, flow, and tension polynomials, *Discrete & Computational Geometry* **66**, no. 2 (2021), 464–474.

[78] M. Beck, B. Braun, and A. R. Vindas-Meléndez, Decompositions of Ehrhart h^*-polynomials for rational polytopes, *Discrete & Computational Geometry* **68**, no. 1 (2022), 50–71 and *Séminaire Lotharingien de Combinatoire* **85B** (2021), Article 38 (FPSAC'21 Proceedings).

[79] M. Beck, E. Janssen, and K. Jochemko, Lattice zonotopes of degree 2, to appear in *Beiträge zur Algebra und Geometrie*.

[80] M. Beck, S. Elia, and S. Rehberg, Rational Ehrhart Theory, *Séminaire Lotharingien de Combinatoire* **86B** (2022), Article 44 (FPSAC'22 Proceedings)

Invited Talks:

Lecture Series at Workshops: Research Encounters in Algebraic and Combinatorial Topics, Summer School *Algorithmic & Enumerative Combinatorics* at the Research Institute for Symbolic Computation (Austria), Spring School *Geometric Combinatorics* in Hanoi (Vietnam), Rocky Mountain Mathematics Consortium *Polyhedral Geometry and Algebraic Combinatorics* in Laramie, Predoc Course *Integer Points in Polyhedra* in Berlin (Germany), MSRI/PIMS/Banff Summer School *Integer-Point Enumeration in Polyhedra* in Banff (Canada).

Plenary Talks: (Polytop)ics: Recent Advances on Polytopes at the Max Planck Institute for Mathematics in the Sciences Einstein Workshop on Polytopes and Algebraic Geometry at FU Berlin, Mathematical Aspects of Computer & Information Science at Gebze–Istanbul, Binghamton University Graduate Conference in Algebra and Topology, Discrete Geometry with a View on Symplectic & Tropical Geometry at Universität Köln, Graduate Student Meeting on Applied Algebra & Combinatorics at the Max Planck Institute Leipzig, Japanese Conference on Combinatorics and its Applications at Sendai, Combinatexas at Texas A&M, Lattice Polytopes Meeting at the Mathematisches Forschungsinstitut Oberwolfach (Germany), Convex, Discrete, and Integral Geometry at Banach Center (Poland), Bay Area Math Olympiad Ceremony, ECCO 2016 at Universidad de Antioquia (Colombia), Discrete Geometry for Computer Imagery at Université de Nantes (France), Conference on Complex Multiplication, Dedekind Sums, Modular Forms, L-Functions and their Interactions with Cryptography and Diophantine Equations at the National Institute for Mathematical Sciences (South Korea), Discrete Math Day at Bard College, Polymake Workshop at TU Berlin (Germany), Atul Vyas Memorial Lecture at Claremont McKenna, Triangle Lectures in Combinatorics at NC State, Bay Area Discrete Math Day at MSRI (Berkeley), Clifford Lectures at Tulane University, Golden Section MAA Meeting at MSRI (Berkeley), Southern California/Nevada MAA Meeting at CalState LA, Discrete Geometry Meeting at the Mathematisches Forschungsinstitut Oberwolfach (Germany), 16th International Conference Jangjeon Mathematical Society in Antalya (Turkey), Pacific North West Number Theory Conference at Simon Fraser University, Conference on Diophantine Analysis and Related Fields at Keio University (Japan).

Conference Talks: Joint Mathematics Meetings in San Diego and Washington, D.C., Mathfests in Burlington, Knoxville, and Lexington, AMS Meetings in Las Vegas, Philadelphia, Bingham-

ton, Cincinnati, Creighton University, Gainesville, Honolulu, Murfreesboro, Providence, Raleigh, Storrs, Toronto, and Williams, CMS Meeting in Vancouver, SIAM Meeting at Colorado State, Deutsche Mathematiker-Vereinigung Meeting in Chemnitz, Discrete Mathematics Days at University of Massachusetts at Amherst and UC Davis, Applications of Computer Algebra, Integers Combinatorial Number Theory Conference at the University of West Georgia, Combinatorial and Additive Number Theory Conference at CUNY, Canadam, Illinois Number Theory Conference.

Colloquia: Universität Magdeburg, Tulane University, Chico State University, Kent State University, James Madison University, Universität Rostock, George Mason University, Case Western University, Research Institute for Symbolic Computation (Linz), Freie Universität Berlin, University of Kentucky, University of San Francisco, Undergraduate Connecticut Valley Colloquium, Universität Frankfurt, Sonoma State University, Santa Clara University, Reed College, Universität Marburg, Universitat de Barcelona, Haverford/Swarthmore Colleges, San Francisco State University, Williams College, McGill University, University of Delaware, University at Albany (SUNY), Vassar College, University of Rochester, Universität Würzburg, Gettysburg College, Binghamton University (SUNY), Carleton University, SUNY Geneseo, Dickinson College, SUNY Potsdam.

Seminars: Washington University St. Louis, St. Petersburg State University & Euler International Mathematical Institute, Queen Mary University of London, École Polytechnique Fédérale de Lausanne, York University, Universität Würzburg, Royal Institute of Technology Stockholm (KTH), National Institute of Standards and Technology, Claremont, Freie Universität Berlin, Research Institute for Symbolic Computation (Linz), University of Kansas, Massachussetts Institute of Technology, Arizona State University, North Carolina State University, Stanford University, Technische Universität Berlin, UC Berkeley, Université Pierre et Marie Curie (Paris 6), Max-Planck-Institut für Mathematik, Mathematical Sciences Research Institute, Quebec–Vermont Number Theory Seminar, University of Washington, Cornell University, University of Kentucky, UC Davis, University of Massachusetts, Bryn Mawr College, William Paterson University, SUNY Albany, University of Scranton, Binghamton University (SUNY), Carleton University, University of Pennsylvania, University of Rochester, City University of New York.

Outreach: Math Circles in Berkeley, Marin, Oakland, San Francisco, San Jose, and Stanford; Math Teacher Circles at the American Institute of Mathematics and the Mathematical Sciences Research Institute; Sommeruni (2-day course for high school students) at Freie Universität Berlin; REUs at Lafayette College and the Mathematical Sciences Research Institute; Mathcamp in Portland, OR.

Grants and Awards

- National Science Foundation
  Research grant DMS-0810105 *Computations in Ehrhart Theory* (PI, $140,414).
  GK–12 grant DGE-0841164 *Creating Momentum through Communicating Mathematics* (PI, $2,960,937).
  Conference grant DMS-0963923 *Formal Power Series and Algebraic Combinatorics* (Co-PI, $49,430).
  Research grant DMS-1162638 *Applications to Ehrhart Theory* (PI, $143,904).

- National Security Agency
  Conference grant *Formal Power Series and Algebraic Combinatorics* 2010 (Co-PI, $19,030).

- Mathematical Association of America
  2012 Award for Distinguished College or University Teaching of Mathematics, Northern California, Nevada & Hawaii section.
  2013 Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics.

- San Francisco State University
  Presidential Award for Professional Development (pre-tenure sabbatical, 2008).
  Summer research grants (2005 & 2006).

Teaching

- Department of Mathematics, San Francisco State University *Fall 2004 – present*
  Concepts of the Number System (for future K–8 teachers), *Calculus II*, *Proofs and Exploration*, *Math Circle Seminar*, *Number Theory*, *Introduction to Functions of a Complex Variable*, *Combinatorics*, *Mathematics of Optimization*, *Modern Algebra I & II*, *Algebra* (graduate), *Enumerative Geometric Combinatorics* (graduate), *Computational Discrete Geometry* (graduate, co-taught with R. Singh, Computer Science Department), *Linear Algebra* (graduate), *Communicating Mathematics* (graduate), *Modular Forms* (graduate).

- Department of Mathematics, Freie Universität Berlin *Fall 2019 – present*
  Probability & Statistics, *Scientific Writing Seminar*, *Discrete Geometry I–III* (graduate), *Capstone Seminar* (graduate).

- Dept. of Mathematical Sciences, Binghamton University (SUNY) *Fall 2000 – Spring 2003*
  Calculus II, *Number Systems*, *Complex Variables*, *Combinatorics*, *Complex Analysis* (graduate), *Discrete Geometry* (graduate).

- Mathematics Department, Temple University *Fall 1997 – Spring 2000*
  Adjunct faculty for *Discrete Structures of Computer Science*.
  Research assistant for *Calculus On the Web* (funded by the National Science Foundation).

Editorial Work

- **Managing Editor** for *PUMP Journal of Undergraduate Research* (2022–present).
- **Managing Editor** for *Combinatorial Theory* (2020–present).
- **Board Member** for *Mathematics in Open Access* (2018–present).
- **Corresponding Editor** for *Bhāvanā* (2018–2021).
- **Member** of the MAA Textbook Series Committee (2014–2019).
- **Managing Editor** for the *Electronic Journal of Combinatorics* (2013–present).
- **Editor** for the *Online Journal of Analytic Combinatorics* (2013–present).
- **Guest Editor** for the special issue *10 Years of BADMath*, *Annals of Combinatorics* **17**, no. 1 (2013).

- **Associate Editor** for *Expositiones Mathematicae* (2011–2012).
- **Associate Editor** for the *Journal of Number Theory* (2004–2012).
- **Member** of the program committee for the *Formal Power Series and Algebraic Combinatorics* conferences 2009, 2011, and 2015.
- **Reviewer** for *Mathematical Reviews* and *Zentralblatt MATH*.
- **Referee** for *Acta Applicandae Mathematicae, Advances in Applied Mathematics, Advances in Geometry, Advances in Mathematics, Aequationes Mathematicae, American Mathematical Monthly, AMS Electronic Research Announcements, Annales de l'Institut Fourier, Applied Mathematics Letters, Archiv der Mathematik, Australasian Journal of Combinatorics, Bulletin of the Institute of Combinatorics and its Applications, Cambridge University Press, College Math Journal, Combinatorica, Comptes rendus Mathématique, Contributions to Discrete Mathematics, Discrete & Computational Geometry, Discrete Applied Mathematics, Discrete Mathematics, Discussiones Mathematicae Graph Theory, L'Enseignement Mathématique, Electronic Journal of Combinatorics, Elemente der Mathematik, European Journal of Combinatorics, Experimental Mathematics, Fibonacci Quarterly, Graphs and Combinatorics, Integers (Electronic Journal of Combinatorial Number Theory), International Journal of Number Theory, Involve, Journal für die reine und angewandte Mathematik, Journal of Algebraic Combinatorics, Journal of the Australian Mathematical Society, Journal of Combinatorial Mathematics and Combinatorial Computing, Journal of Combinatorial Theory, Journal of the European Mathematical Society, Journal of Geometry, Journal of Integer Sequences, Journal of Mathematical Analysis and Applications, Journal of Number Theory, Mathematica Slovaca, Mathematics of Computation, Mathematics of Operations Research, Mathematische Annalen, Mathematische Zeitschrift, Monatshefte für Mathematik, Moscow Journal of Combinatorics and Number Theory, Moscow Mathematical Journal, Notices of the AMS, Pacific Journal of Mathematics, Proceedings of the Edinburgh Mathematical Society, Proceedings of the Royal Society A, Ramanujan Journal, Research in Number Theory, Results in Mathematics, Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales, Revista Matemática Iberoamericana, Rocky Mountain Journal of Mathematics, Selecta Mathematica, SIAM Journal on Optimization, Springer, Studia Sci. Math. Hungarica, Transactions of the AMS, Transformation Groups*.

Service and Related Experience

- **Committee service**: San Francisco State University
  Mathematics Department: Chair Review Committee, Faculty Council, Graduate Committee, Hiring Committee, Retention, Tenure, and Promotion Commitee, Website Committee.
  University: Fellowship Committee, Graduate Council, Honorary Degree Committee, Liberal Studies Council, Professional Development Council, Student Success/Graduation Initiative Task Force, Teacher Credential Committee.
- **Committee service**: American Mathematical Society
  Mathematics Research Communities Advisory Board (2014–2017), Committee on Academic Freedom, Tenure, and Employment Security (2017–2020).
- **Conference coorganizer**
  Coorganizer (with A. Barvinok, C. Haase, B. Reznick, M. Vergne, and V. Welker) of the

2003 AMS-IMS-SIAM Summer Research Conference *Integer Points in Polyhedra. Geometry, Number Theory, Algebra, Optimization*.
Coorganizer (with R. Datta, J. Gubeladze, S. Hoşten, T. Hsu, N. Thiem, A. Schilling, M. Vazirani, and A. Yong) of the *Bay Area Discrete Math Day*, 2004–2006.
Coorganizer (with S. Robins) of the 2005 MSRI/PIMS/Banff summer school *Integer-point enumeration in polyhedra*.
Coorganizer (with F. Ardila) of the special session *Enumerative Aspects of Polytopes* at the Spring 2006 AMS Western Section Meeting.
Coorganizer (with C. Haase, B. Reznick, M. Vergne, V. Welker, and R. Yoshida) of the 2006 AMS-IMS-SIAM Summer Research Conference *Integer Points in Polyhedra. Geometry, Number Theory, Representation Theory, Algebra, Optimization, Statistics*.
Coorganizer (with S. Wagon and K. Woods) of the special session *The Linear Diophantine Problem of Frobenius*, 2008 Joint Mathematics Meetings.
Coorganizer (with L. Fukshansky) of the special session *Diophantine Problems and Discrete Geometry* at the Spring 2008 AMS Western Section Meeting.
Coorganizer (with K. O'Hara, A. Serenevy, and S. Vandervelde) of the MSRI workshop *Great Circles 2009*.
Coorganizer (with C. Haase) of the special session *Algebra & Number Theory With Polyhedra* at the Spring 2009 AMS Western Section Meeting.
Coorganizer (with P. Gunnels and A. Sikora) of the workshop *Dedekind Sums in Geometry, Topology, and Arithmetic* 2009, Banff Research Station, Canada.
Coorganizer (with F. Ardila) of the 2010 conference *Formal Power Series and Algebraic Combinatorics* at San Francisco State University.
Coorganizer (with J. Gubeladze and M. Henk) of the special session *Polyhedral Number Theory* at the Fall 2014 AMS Western Section Meeting.
Coorganizer (with F. Ardila, J. Carter, and K. Seashore) of the special session *Social Change in and through Mathematics & Education* at the Fall 2018 AMS Western Section Meeting.
Coorganizer (with B. Braun, K. Jochemko, and F. Liu) of the 2022 workshop *Ehrhart Polynomials: Inequalities and Extremal Constructions* at the American Institute of Mathematics.

- **Research adviser**
MA: Juan Auli (SFSU MA'15), Leo Bardomero (SFSU MA'18), Andrew Beyer (SFSU MA'10), Anastasia Chavez (SFSU MA'10), Steven Collazos (SFSU MA'13), Aaron Dall (SFSU MA'08), Brian Davis (SFSU MA'14), Jessica Delgado (SFSU MA'13), Nick Dowdall (SFSU MA'11), Eric Etu (SFSU MA'07), Logan Godkin (SFSU MA'12), Mary Halloran (SFSU MA'07), Mela Hardin (SFSU MA'11), Andrew Herrmann (SFSU MA'10), Mike Jackanich (SFSU MA'11), Gina Karunaratne (SFSU MA'17), Curtis Kifer (SFSU MA'10), Florian Kohl (Würzburg BA'13), Nguyen Le (SFSU MA'10), Asia Matthews (SFSU MA'07), Emily McCullough (SFSU MA'16), Dorothy Moorefield (SFSU MA'06), Louis Ng (SFSU MA'18), Tu Pham (SFSU MA'11), Alex Plotitsa (SFSU MA'10), Kim Seashore (SFSU MA'07), Andrew Van Herick (SFSU MA'07), Hannah Winkler (SFSU MA'14), Sandra Zuniga Ruiz (SFSU MA'16).
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Postdocs: Thomas Bliem (2009–2010), Felix Breuer (2011–2013).
Member of several M.A. and Ph.D. committees at Binghamton University (SUNY), École Polytechnique, École Polytechnique Fédérale de Lausanne, Freie Universität Berlin, Hong

Kong University of Science and Technology, Nanyang Technological University, San Francisco State University, Stockholm University, UC Berkeley, UC Davis, Universidad de Los Andes, Universidade de São Paulo, Universita di Bologna, Universität Linz, Universität Magdeburg, and Universität Rostock.
Research director for MSRI-UP 2012, the NSF-funded REU program at the Mathematical Sciences Research Institute.
Research leader for REUF 2014, the NSF-funded research program for undergraduate faculty at the American Institute of Mathematics.

- **Faculty adviser**
Adviser to the Undergraduate Math Club and the MAA Student Chapter at Binghamton University (SUNY) (2000–2003).
Graduate Adviser for the San Francisco State University Mathematics Department (2006–07 and 2013–2016).
Graduate Mentor for the National Alliance for Doctoral Studies in the Mathematical Sciences (2009–present).

- **Grant Reviewer** for the *Austrian Science Fund*, the *Deutsche Forschungsgemeinschaft (German Research Foundation)*, the *Natural Sciences and Engineering Research Council of Canada*, the *Research Grants Council of Hong Kong*, and the *US National Science Foundation*.

- **Co-Director**: San Francisco Math Circle (2005–2014).
An integrated weekly program for teachers and K–12 students, centering around intriguing and challenging problems.

- **Consultant**: Project NExT (2009/10, 2014–2016, 2021/22).