

# federico ardila

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federico@sfsu.edu      http://math.sfsu.edu/federico

- Research interests**      The investigation of objects in algebra, geometry, topology, phylogenetics, and optimization by understanding their underlying combinatorial structure.
- Education**      Ph.D. in Mathematics, Massachusetts Institute of Technology, Cambridge, MA, USA, 2003.  
Thesis: Enumerative and algebraic aspects of matroids and hyperplane arrangements.  
Advisor: Richard P. Stanley  
B.Sc. in Mathematics, Massachusetts Institute of Technology, Cambridge, MA, USA, 1998.
- Awards and honors**      National Science Foundation CAREER Award, 10-15.  
Diverse Issues in Higher Education, Emerging Scholar Award, 11.  
MIT-Harvard Club de Colombia, Award for Outstanding Achievement and Service, 10.  
Clay Mathematics Institute, Affiliate Scholar, 04-06.  
Mathematical Sciences Research Institute/Microsoft Postdoctoral Fellowship, 03-05.  
American Institute of Mathematics Five-Year Fellowship, runner up, 03.  
SFSU Presidential Award, 09-10.  
SFSU Faculty Diversity Support Award, 06-07.  
MIT Department of Mathematics, Housman Award for Excellence in Teaching, 01.  
William Lowell Putnam Mathematics Competition, top 10, 96.  
International Mathematical Olympiad, silver medal, 94; bronze medal, 93.  
Iberoamerican Mathematical Olympiad, gold medal, 93; bronze medal, 91.
- Experience**      Associate Professor, San Francisco State University, San Francisco, CA, 11-current.  
Adjunct Professor, Universidad de Los Andes, Bogotá, Colombia, Fall 06-current.  
Visiting Professor, University of California at Berkeley, Berkeley, CA, 12-13.  
Research Member, Mathematical Sciences Research Institute, Berkeley, CA, Fall 09.  
Assistant Professor, San Francisco State University, San Francisco, CA, 05-11.  
Assistant Professor, University of Washington, Seattle, WA, USA, 05.  
Postdoctoral Fellow, Microsoft Theory Group, Redmond, WA, USA, 04-05.  
Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley, CA, 03-04.  
Assistant Professor, Universidad de los Andes, Bogotá, Colombia, Fall 03.
- Professional activities**      Editor-in-Chief, Journal of Combinatorial Theory Ser. A, 14-current.  
Editor, Revista Colombiana de Matemáticas, 11-current.  
Editor, Lecturas Matemáticas, 08-current.  
Director, MSRI Undergraduate Program, Berkeley, CA, USA, 14-current.  
Director, SFSU-Colombia Combinatorics Initiative, 06-current.  
Chairman of the Problem Selection Committee, International Mathematical Olympiad, 13.
- Grants**      National Science Foundation CAREER Grant, 10-15.  
National Science Foundation Grant, Algebra, Number Theory and Combinatorics, 08-11.  
National Science Foundation Grant, Conferences, Workshops and Mtgs. in Math. Sci. 10-11.  
National Security Agency Grant, Conferences, Workshops and Special Situations, 10.  
Seed Funding Grant, San Francisco State University, 07-08.

## Preprints

(At math.sfsu.edu/federico)

## Publications

1. *The closure of a linear space in a product of lines*, with A. Boocher, submitted, 2013.
1. *Positively oriented matroids are representable*, with F. Rincón and L. Williams. To appear in Journal of the European Math. Society.
2. *Positroids and non-crossing partitions*, with F. Rincón and L. Williams. To appear in Transactions of the American Math. Society.
3. *The arithmetic Tutte polynomials of the classical root systems*, with F. Castillo and M. Henley. To appear in Int. Math. Research Notices.
4. *Moving robots efficiently using the combinatorics of  $CAT(0)$  cubical complexes*, with T. Baker and R. Yatchak. SIAM Journal of Discrete and Applied Mathematics **28** (2014) 986–1007.
5. *Two counterexamples for power ideals of hyperplane arrangements*, with A. Postnikov. Correction to “Combinatorics and geometry of power ideals.” To appear in Transactions of the American Mathematical Society.
6. *Universal polynomials for Severi degrees of toric surfaces*, with F. Block. Advances in Mathematics. **237** (2013) 165-193.
7. *Lifted generalized permutahedra and composition polynomials*, with J. Doker. Advances in Applied Mathematics **50** (2013) 607-633.
8. *Acyclic systems of permutations and fine mixed subdivisions of simplices*, with C. Ceballos. Discrete and Computational Geometry. **49** (2013) 485-510.
9. *Geodesics in  $CAT(0)$  cubical complexes*, with M. Owen and S. Sullivant. Advances in Applied Mathematics **48** (2012) 142-163.
10. *Staircase Schur functions are  $P$ -Schur positive*, with L. Serrano. J. of Algebraic Combinatorics **36** (2012) 409-423.
11. *Gelfand-Tsetlin polytopes and Feigin-Fourier-Littelmann-Vinberg polytopes as marked poset polytopes*, with T. Bliem and D. Salazar. J. of Combinatorial Theory, Ser. A. **118** (2011) 2454-2462.
12. *Root polytopes and growth series of root lattices*, with M. Beck, S. Hosten, J. Pfeifle, and K. Seashore. SIAM Journal of Discrete Mathematics **25** (2011) 360-378.
13. *Combinatorics and geometry of power ideals*, with A. Postnikov, Transactions of the American Mathematical Society **362** (2010), 4357-4384.
14. *Matroid polytopes and their volumes*, with C. Benedetti and J. Doker, Discrete and Computational Geometry **43** (2010) 841-854.
15. *When do two planted graphs have the same cotransversal matroid?*, with A. Ruiz. Boletín de la Sociedad Mexicana de Matemáticas. **16** (2010) 63-73.
16. *Tropical hyperplane arrangements and oriented matroids*, with M. Develin, Mathematische Zeitschrift. **262** (2009) 795-816.
17. *Valuations for matroid polytope subdivisions*, with A. Fink and F. Rincón. Canadian Journal of Mathematics **62** (2010) 1228-1245.
18. *Pruning processes and a new characterization of convex geometries*, with E. Maneva, Discrete Mathematics. **309** (2009) 3083-3091.
19. *Flag arrangements and triangulations of products of simplices*, with S. Billey, Advances in Mathematics. **214** (2007) 495-524.
20. *Transversal and cotransversal matroids via the Lindström lemma*, Electronic Journal of Combinatorics **14** (2007) N6.
21. *Bergman complexes, Coxeter arrangements, and graph associahedra*, with V. Reiner and L. Williams, Seminaire Lotharingien de Combinatoire **54A** (2006) B54Aj.
22. *The positive Bergman complex of an oriented matroid*, with Carly Klivans and Lauren Williams, European J. Combin. **27** (2006) 577-591.

23. *The Bergman complex of a matroid and phylogenetic trees*, with Carly Klivans, J. Combin. Th. Ser. B. **96** (2006) 38-49.
24. *Subdominant matroid ultrametrics*, Ann. Comb. **8** (2004) 379-389.
25. *The Catalan matroid*, J. Combin. Theory Ser. A **104** (2003) 43-62.
26. *Computing the Tutte polynomial of a hyperplane arrangement*, Pacific J. Math. **230** (2007) 1-26.
27. *Semimatroids and their Tutte polynomials*, Revista Colombiana de Matemáticas. **41** (2007) 39-66.
28. *The number of halving circles*, Amer. Math. Monthly **111** (2004) 586-592.
29. *The coefficients of a Fibonacci power series*, Fibonacci Quart. **42** (2003) 202-204.
30. *A generalization of Euler's  $R \geq 2r$* , Crux Math. **21** (1995) p.1-2.
31. *Enumerative and algebraic aspects of matroids and hyperplane arrangements*, Ph.D. thesis, Massachusetts Institute of Technology, 2003.

## Expository

1. *Tres lecciones en combinatoria algebraica, I. Matrices totalmente negativas y funciones simétricas*, with E. León, M. Rosas, and M. Skandera, universo.math **1** (2014) No. 1, Artículo 5.
2. *Tres lecciones en combinatoria algebraica, II. Funciones simétricas y teoría de representaciones*, with E. León, M. Rosas, and M. Skandera, universo.math **1** (2014) No. 2, Artículo 5.
3. *Tres lecciones en combinatoria algebraica, III. Arreglos de hiperplanos*, with E. León, M. Rosas, and M. Skandera, universo.math, to appear.
4. *Tilings*, with Richard Stanley. *Clay Mathematics Institute Online Library*. The Mathematical Intelligencer **32** (2010) 32-43
5. *Pflasterungen*, German translation of *Tilings* by Günter Ziegler, Math. Semesterber. **53** (2006) 17-43.
6. *Teselaciones*, Spanish translation of *Tilings* by Carolina Benedetti. Gaceta de la Real Sociedad Matemática Española **14** (2011) 463-490.

## Books

1. *Handbook of Enumerative Combinatorics*, with M. Bona et. al., in progress.
2. *54th International Mathematical Olympiad, Problem Shortlist with Solutions*, with I. Bogdanov, G. Kós, C. Moreira, and C. Reiher. Santa Marta, Colombia, 2013.
3. *Problemas y soluciones de los entrenamientos de las Olimpiadas Colombianas de Matemáticas*, with Carlos Caicedo, Mary Falk de Losada and Carlos Vargas, Universidad Antonio Nariño, Bogotá, Colombia, yearly publications, 1997-2002.

## Advising

Tristram Bogart. NSF Postdoctoral fellow, MSRI 09, San Francisco State University 10-11.

Anastasia Chávez, Ph.D. student, U. of California, Berkeley, w/ Lauren Williams, current.

Jeff Doker. Ph.D. student, U. of California, Berkeley, with Matt Beck, 11.

Alex Fink. Ph.D. student, U. of California, Berkeley, with Bernd Sturmfels, 10.

Matt Cadier Kim. M.Sc. student, San Francisco State University, current.

David Klein. M.Sc. student, San Francisco State University, current.

Servando Pineda. M.Sc. student, San Francisco State University, 14.

Hannah Winkler. M.Sc. student, San Francisco State University, w/ Matt Beck, 14.

Zach Bowen. M.Sc. student, San Francisco State University, 13.

Alyssa Palfreyman. M.Sc. student, San Francisco State University, 13.

Michael Henley. M.Sc. student, San Francisco State University, 12.  
 Rika Yatchak. M.Sc. student, San Francisco State University, 12.  
 Tia Baker. M.Sc. student, San Francisco State University, 11.  
 Dido Salazar. M.Sc. student, San Francisco State University, with T. Bliem, 11.  
 Benjamín Iriarte. M.Sc. student, San Francisco State University, 10.  
 Laura Escobar. M.Sc. student, San Francisco State University, 10.  
 Amanda Ruiz. M.Sc. student, San Francisco State University, 09.  
 Jameson Cahill. M.Sc. student, San Francisco State University, w/ S Li, A Schuster, 09.  
 Jupei Hsiao. M.Sc. student, San Francisco State University, 09.  
 Kristen Freeman. M.Sc. Student, San Francisco State University, 09.  
 Carolina Benedetti. M.Sc. student, Universidad de los Andes, 08.  
 César Ceballos. M.Sc. student, Universidad de los Andes, 08.  
 Anna Brown. M.Sc. student, San Francisco State University, 07.  
 Felipe Rincón. M. Sc. student, Universidad de los Andes, 07.

David Arcila. Undergraduate thesis. Universidad Nacional de Colombia, current.  
 Hanner Bastidas. Undergraduate thesis. Universidad del Valle, current.  
 Andrés Saldaña. Undergraduate thesis. Universidad del Valle, current.  
 Diego Cifuentes. Undergraduate thesis, Universidad de los Andes, 12.  
 Ana María Botero. Undergraduate thesis, Universidad de los Andes, w/ B. Uribe, 11.  
 José Samper. Undergraduate thesis, Universidad de los Andes, 11.  
 Benjamín Iriarte. Undergraduate thesis, Universidad de Los Andes, 09.  
 Chris O'Neill. Undergraduate independent research, San Francisco State University, 09.  
 Emerson León. Undergraduate thesis, Universidad Nacional de Colombia, 06.  
 Felipe Rincón. Undergraduate thesis, Universidad de los Andes, 06.  
 David Otero. Undergraduate thesis, Universidad de los Andes, 04.

Igor Kortchemski. High school research, Clay Research Academy, 05, with Richard Stanley.

**Selected talks  
(invited intnatl.)**

Congreso Mexicano de Matemáticas, Plenary Speaker, San Luis Potosí, México, 11.  
 Congreso Colombiano de Matemáticas, Plenary Speaker, B/manga, Colombia, 11.  
 Pacific Rim Mathematical Association Congress, Plenary Speaker, Sydney, Australia, 09.  
 NIMS Hot Topics Workshop on Algebraic Combinatorics, Daejeon, Korea, 09.  
 MSRI Tropical Geometry Program, Connections for Women Mini-course, Berkeley, USA, 09.  
 José Adem Memorial Lecture Series, Plenary Speaker, Cinvestav, México, 07.  
 Congreso Colombiano de Matemáticas, Plenary Speaker, Bogotá, Colombia, 05.

**(invited national)**

SACNAS, Modern Math Workshop Plenary Speaker, San Antonio, TX, 13.  
 Congreso Colombiano de Matemáticas, Invited Speaker, Barranquilla, Colombia, 13.  
 USTARS, Plenary Speaker, Iowa City IA, 12.  
 SACNAS, Modern Math Workshop, Minicourse, San Jose, CA, 11.  
 CombinaTexas, Plenary Speaker, Huntsville, TX, USA, 11.  
 Escuela de Matemática Pura y Aplicada, Mini-course, Gurabo, Puerto Rico, 11.  
 Congreso Regional de Matemáticas, Mini-course, Girardot, Colombia, 06.  
 Escuela Matem. de América Latina y del Caribe, Mini-course, Socorro, Colombia, 06.  
 Combinatoria Algebraica y Topológica, Mini-course, Bogotá, Colombia, 03.

- (international)**
- Perspectives in Lie Theory, Centro di Rec. Mat. De Giorgi, Pisa, Italy 15.
  - Coloquio Latinoamericano de Álgebra, Perú 14, Colombia 07, Uruguay 05.
  - Oberwolfach Workshop on Tropical Aspects in Geometry, Topology and Physics, 14.
  - Workshop on Structure in Graphs and Matroids, Princeton, NJ, USA, 14.
  - Geometric and Enumerative Combinatorics, Inst. for Math. + Apps., Minneapolis, MN, 14.
  - FPSAC International Conference, 14, 13, 12, 11, 09, 07, 06, 05, 04, 03, 02
  - Topology and Combinatorics Session, Math. Congress of the Americas, Guan., México, 13.
  - Enumerative Combinatorics Session, Math. Congress of the Americas, Guan., México, 13.
  - Matroids, Oriented Matroids, and Applications, CIRM, Marseille, France, 13.
  - Combinatorial Methods in Topology and Algebra, Cortona, Italy, 13.
  - Geometría Tropical en el Pacífico, Oaxaca, Mexico, 13.
  - Coxeter Groups meet Convex Geometry, Montreal, QC, Canada, 12.
  - SIAM Minisymposium on Algebraic Combinatorics, Halifax, NS, Canada, 12.
  - Combinatorial Algebra meets Algebraic Combinatorics, Montreal, QC, Canada, 12.
  - Perspectives in Tropical Geometry, Arolla, Switzerland, 11.
  - Workshop on Tropical Geometry, Castro Urdiales, Spain, 11.
  - Encuentro de Geometría Tropical, Guanajuato, Mexico, 10.
  - Joint Meeting of the American and Mexican Math. Societies, Berkeley, CA, USA, 10.
  - SIAM Minisymposium on Combinatorial Hopf Algebras, Austin, TX, USA, 10.
  - AIM Wkshp. on Localiz. Techn. in Equivariant Cohomology, Palo Alto CA, USA, 10.
  - Combinatorial Algebra meets Algebraic Combinatorics, Kingston, ON, Canada, 10.
  - Joint Meeting of the Korean and American Mathematical Societies, Seoul, Korea, 09.
  - Inst. Pure Appl. Math., Workshop on Combin. Geometry, Los Angeles, CA, USA, 09.
  - Mathematical Society of Japan, Seasonal Institute, Sapporo, Japan, 09.
  - AIM Workshop on Combin. Challenges in Toric Varieties, Palo Alto, CA, USA, 09.
  - Oberwolfach Workshop on Tropical Geometry, Germany, 07.
  - Interactions of Alg. Combinatorics and Alg. Geometry, CRM, Montréal, Canada, 07.
  - Combin. Hopf Algebras and Macdonald Polynomials, CRM, Montréal, Canada, 07.
  - Combinatorial Geometries and Applications, CIRM, Marseille, France, 05.
  - Arrangements of Hyperplanes, Ascona, Switzerland, 05.
  - MSRI Workshop on Hyperplane Arrangements, Berkeley, CA, USA, 04.
  - PCMI Research Program in Geometric Combinatorics, Park City, UT, USA, 04.
  - MSRI Workshop on Applicable Real Algebraic Geometry, Berkeley, CA, USA, 04.
  - AIM Workshop on Amoebas and Tropical Geometry, Palo Alto, CA, USA, Oct. 03.
- (national)**
- Richard Stanley's Birthday Conference, MIT, Cambridge, MA, USA, 14.
  - AMS Session, Toric Varieties, Eau-Claire, WI, 14.
  - AMS Session, Algebraic and Topological Combinatorics, San Francisco, CA, 14.
  - MAA MathFest, Portland, OR, 14.
  - ALTENCOA, Pasto, Colombia, 14.
  - Western Algebraic Geometry Seminar, Claremont, CA, 13.
  - Séminaire de Combinatoire Philippe Flajolet, Paris, France, 13.
  - AMS-MAA Session, Algebraic Combinatorics and Representation Th., San Diego, CA, 13.
  - AMS-MAA Session, Topological Combinatorics, San Diego, CA, 13.
  - AMS-MAA Session, Tropical Geometry, San Diego, CA, 13.
  - AMS Session, Combinatorial Commutative Algebra, Philadelphia, PA, 13.

- AMS Session, Graphs, Polytopes, and Algebraic Combinatorics, Akron, OH, 12.  
 AMS-MAA Session, Enumerative and Algebraic Combinatorics, Boston, MA, 12.  
 AMS Session, Enumerative and Geometric Combinatorics, Lawrence, KS, 12.  
 SIAM Session, Combinatorial Algebraic Geometry, Minneapolis, MN, 12.  
 PURE Math, University of Hawaii, Hilo, HI, 12.  
 SACNAS Conference, Session on Interdisciplinary Algebra, San Jose, CA, USA, 11.  
 AMS Session, Species and Hopf Algebraic Combinatorics, Ithaca, NY, USA, 11.  
 AMS Session, Alg. and Geom. Aspects of Matroids, Winston-Salem, NC, USA, 11.  
 CMS Session, Discrete Mathematics, Vancouver, BC, Canada, 10.  
 AMS Session, Geometric Combinatorics, Albuquerque, NM, USA, 10.  
 AMS-MAA Session, Zonotopal Algebra and Applications, San Francisco, CA, USA, 10.  
 SACNAS Conference, Math Institutes Modern Math Workshop, Dallas, TX, USA, 09  
 Saturday in Discrete Mathematics, Emmy-Noether-Zentrum, Erlangen, Germany, 09.  
 AMS Session, Representation Th. and Topolog. Combin., Bloomington, IN, USA, 08.  
 AMS Session, Geometric Combinatorics, Chicago, IL, USA, 07.  
 Congreso Colombiano de Matemáticas, Semiplenary Speaker, Medellín, Colombia, 07.  
 AMS Session, Geometric Combinatorics, Cincinnati, OH, USA, 06.  
 Discrete Mathematics Days in New England, USA, 05, 02.  
 AMS-MAA Session, Tropical Geometry, Atlanta, GA, USA, 05.  
 Jornadas de Matemática Discreta y Algorítmica, Madrid, Spain, 04.  
 Richard Stanley's Birthday Conference, MIT, Cambridge, MA, USA, 04.  
 Bay Area Discrete Mathematics Day, Stanford University, Palo Alto, CA, USA, 04.  
 AMS Session, Topological Combinatorics, Binghamton, NY, USA, 03.  
 AMS Session, Algebraic and Enumerative Combinatorics, Orlando, FL, USA, 02.  
 AMS Session, Algebraic and Topological Combinatorics, Williamstown, MA, USA, 01.  
 Dan Kleitman's Birthday Conference, MIT, Cambridge, MA, USA, 99.
- (invited seminars)** Universidad del Valle Colloquium, Cali, Colombia, 14, 12.  
 Cornell University Combinatorics Seminar, Ithaca, NY, 13, 11, 04.  
 Cornell University Topology Seminar, Ithaca, NY, 13.  
 Universidad de Los Andes Colloquium, Bogotá, Colombia, 13, 12, 08, 05, 03, 01.  
 Institut Mathématiques de Jussieu Tropical Geometry Seminar, Paris, France, 13.  
 Royal Institute of Technology (KTH) Combinatorics Seminar, Stockholm, Sweden, 13.  
 University of Southern California Colloquium, Los Angeles, CA, USA, 13.  
 Dartmouth Mathematics Colloquium, Hanover, NH, USA, 12.  
 MIT Combinatorics Seminar, Cambridge, MA, USA, 12, 10, 09, 07, 03.  
 Brown University Discrete Math Seminar, Providence, RI, USA, 12.  
 University of California, Discrete Mathematics Seminar, Davis, CA, USA, 12, 09, 03.  
 UCLA Combinatorics Seminar, Los Angeles, CA, USA, 11.  
 University of Puerto Rico, Mathematics Colloquium, Río Piedras, PR, USA, 11.  
 University of California, Combinatorics Seminar, Berkeley, USA, 11, 06, 04.  
 University of Michigan, Combinatorics Seminar, Ann Arbor, MI, USA, 11, 08.  
 San Francisco State University Colloquium, San Francisco, CA, USA, 11, 05.  
 Sonoma State University Colloquium, Sonoma, CA, USA, 11.  
 Northeastern University, Geometry, Algebra, Sing. and Combin. Seminar, Boston, MA, 10.  
 University of San Francisco Mathematics Colloquium, San Francisco, CA, USA, 10.

University of Washington, Combinatorics Seminar, Seattle, USA, 09, 06, 04.  
 University of Texas, Number Theory Seminar, Austin, TX, USA, 08.  
 Texas A&M, Algebra and Combinatorics Seminar, College Station, TX, USA, 08.  
 University of California, Comm. Algebra and Alg. Geometry Sem., Berkeley, CA, USA, 08.  
 Universidad Nacional, Mathematics Colloquium, Bogotá, Colombia, 08.  
 Stanford University, Combinatorics and Geometry Seminar, Palo Alto, CA, USA, 08.  
 Santa Clara University, Mathematics Colloquium, Santa Clara, CA, USA, 08.  
 Technische Universität, Seminar der AG Gitterpolytope, Berlin, Germany, 07.  
 University of British Columbia, Discrete Mathematics Seminar, Vancouver, BC, Canada, 05.  
 University of California, Colloquium, San Diego, CA, USA, 04.  
 University of Minnesota, Combinatorics Seminar, Minneapolis, MN, USA, 04.  
 University of California, Seminar on Phylogenetics, Berkeley, CA, USA, 03.  
 Universidad de Los Andes, Combinatorics Seminar, Bogotá, Colombia, 03.

**(public)**

TEDx Teusaquillo, Invited Speaker, Bogotá, Colombia, 12.  
 American Institute of Mathematics, Careers in Academia Panel, 11.  
 Bay Area Mathematical Adventures, Invited Speaker, Santa Clara, CA, 10.  
 José Adem Memorial Lecture Series, Public Lecture, Cinvestav, México, 07.  
 Bay Area Mathematical Olympiad, Awards Ceremony Speaker, Berkeley, CA, 07.  
 Ministerio de Educación, Foro de Ed. Matem., Invited Speaker, Bogotá, Colombia, 06.  
 Olimpiadas Colombianas Matem., Closing Ceremony Speaker, Bogotá, Colombia, 05.

**Conference organization**

Organizer, XXII FPSAC International Conference, San Francisco, USA, 10.  
 Organizer, Tropical Geometry in Combin. and Alg. Workshop, MSRI, Berkeley, USA, 09.  
 Organizer, Combinatorics Session, Latin American Congress of Mathematicians, Chile, 09.  
 Steering Committee Member, Pacific Rim Mathematical Association, 09-current.  
 Organizing Committee Member, Latinos in Math., IPAM, UCLA, Los Angeles, USA, 15.  
 Scientific Committee, Congreso Colombiano de Matemáticas, Colombia, 13, 09, 07.  
 Programme and Organizing Committees, XX FPSAC International Conference, Chile, 08.  
 Scientific Committee, XVII Coloquio Latinoamericano de Algebra, Medellín, Colombia, 07.  
 Scientific Committee, ALTENCOA National Conference, Popayán, Colombia, 06.  
 Organizer, Encuentro Colombiano de Combinatoria, Bogotá, Colombia, 14, 12, 08, 03.  
 Organizer, AMS Special Session, Algebraic Combinatorics, Honolulu, HI, USA 12.  
 Organizer, AMS Special Session, Matroids in Algebra and Geom., San Francisco, USA, 09.  
 Organizer, Combinatorics Session, Coloquio Latinoamericano de Algebra, Colombia, 07.  
 Organizer, 14th Bay Area Discrete Math Day, San Francisco, USA, 07.  
 Organizing Committee, Bay Area Discrete Math Days, San Francisco, USA, 06-current.  
 Organizer, AMS Special Session, Enumeration in Polytopes, San Francisco, USA, 06.  
 Organizer, SFSU Mathematics Colloquium, San Francisco, USA, 06-09.  
 Organizer, SFSU Alg. Geom. Combinatorics Seminar, San Francisco, USA, 06-current.

**Outreach**

Advisory Board Member, International Mathematical Olympiads, 03-06.  
 Colombian Team Leader, International Mathematical Olympiads, 99-08.  
 Colombian Team Deputy Leader, International Mathematical Olympiads, 95-98.  
 Academic Coordinator, Central American and Caribbean Math. Olympiad, 01.  
 NightLife at the California Academy of Sciences, Guest Mathematician, San Francisco, 14.

Guest Lecturer, DaVinci Camp, Berkeley, USA, 14.

Guest Lecturer, Berkeley Math Circle, Berkeley, USA, 07.

Lecturer, San Francisco Math Circle, San Francisco, USA, 06-07.

Academy Fellow, Clay Mathematics Research Academy, Cambridge, USA, 03-05.

**Refereeing  
and reviewing**

National Science Foundation (USA), National Security Agency (USA), Alliance for Building Faculty Diversity in the Mathematical Sciences (USA), Isaac Newton Institute (UK), Natural Sciences and Engineering Research Council (Canada), Comisión Nacional de Ciencia y Tecnología (Chile)

Acta Mathematica, Advances in Applied Mathematics, Advances in Mathematics, American Mathematical Monthly, Annals of Combinatorics, Applied Mathematics Letters, Combinatorica, Crelle's Journal, Discrete and Computational Geometry, Discrete Mathematics, Electronic Journal of Combinatorics, European Journal of Combinatorics, Gokova Geometry–Topology Journal, Graphs and Combinatorics, Information Processing Letters, International Mathematics Research Notices, Journal of Algebra and its Applications, Journal of Algebraic Combinatorics, Journal of Combinatorial Theory Series A, Journal of Combinatorial Theory Series B, Journal of Statistical Planning and Inference, Journal of Symbolic Computation, Mathematica Scandinavica, Mathematics in Computer Science, Revista Colombiana de Matemáticas, Revista de la Escuela Regional de Matemáticas, Selecta Mathematica, SIAM Journal on Discrete Mathematics, Transactions of the American Mathematical Society, Transformation Groups, Theoretical Computer Science.

International Conference on Formal Power Series and Algebraic Combinatorics. (FPSAC)