VITAE

Jesús Antonio De Loera

PERSONAL INFORMATION

Birthdate: January 18, 1966
Married, two children
Citizenship: USA and México
Languages: Fluent in Spanish, French, and English.
                  Intermediate knowledge of German,
                  Beginners knowledge of Italian and Portuguese.

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EDUCATION

Ph.D.	Cornell University, Applied Mathematics, April 1995.
M.S	Cornell University, Applied Mathematics (Operations Research), February 1993.
M.A.	Western Michigan University, Mathematics, May 1990.
B.S.	National University of Mexico, Mathematics, May 1989.
	(Honors thesis: *"On the genus of finite groups"*)

Doctoral Dissertation
Title: *"Triangulations of Polytopes and Computational Algebra."*
Advisor: Professor Bernd Sturmfels (UC Berkeley/MPI Leipzig).

RESEARCH INTERESTS

Combinatorics, Discrete Mathematics.
Algorithms and Computation in Algebra, Combinatorics ,& Geometry.
Convex and Discrete Geometry, Geometry of Numbers.
Algebraic, Geometric, and Topological methods in Applied Mathematics.
Optimization, Operations Research, Data Science, and Other applications.

PROFESSIONAL EXPERIENCE

<u>2005-to date</u>: Professor of Mathematics and member of the Graduate groups in Computer Science and Applied Mathematics, University of California, Davis.

<u>2014-2015</u>: Professor and Faculty Assistant to the Dean of Math. and Physical Sciences for Undergraduate Affairs, UC Davis (equivalent to associate dean position).

<u>2012-2014</u>: Professor and Vice-Chair of Undergraduate Affairs for the Mathematics Department, UC Davis.

<u>2002-2005</u>: Associate Professor, Dept. of Mathematics, University of California, Davis.

<u>1998-2001</u>: Assistant Professor, Dept. of Mathematics, University of California, Davis.

<u>1998-1999</u>: Visiting researcher, Dept. of Computer Science, Swiss Federal Institute of Technology Zürich (ETH-Zürich).

<u>1995-1998</u>: Visiting Assistant Professor of Mathematics, University of Minnesota.

<u>1991-1994:</u> Teaching and Research assistant, Cornell University.

<u>1987-1988:</u> Teaching and Research assistant, National University of Mexico.

ACADEMIC HONORS

Awards, Fellowships

- 2018 Distinguished Teaching Award, College of Letters and Science UC Davis.

- 2017 Golden Section Teaching award of the Mathematical Association of America.

- 2014 Fellow of the American Mathematical Society.

- 2014 Bernard Society Lecturer, Davidson College.

- 2013 Chancellor's award in undergraduate research mentoring.

- 2013 Kemeny Lecture award, Dartmouth College.

- 2012 John von Neumann professor, Technical University of Munich, Germany.

- 2011 Alumni Achievement Award, Western Michigan Univ.

- 2010 co-winner of the INFORMS computer society prize.

- 2007 UC Davis, Award for excellence in service to graduate students, UC Davis Graduate Student Association.

- 2006 UC Davis, Principles of community and Diversity Award.

- 2004 Alexander Von Humboldt Award.

- 2003-2008 UC Davis, Chancellor's fellow Award.

- 2001 Galois Group Award to individuals who serve the mathematics graduate program in a unique way.

- Postdoctoral fellowship at the Geometry Center of the University of Minnesota.

- National University of Mexico doctoral Fellowship (1989-1995).

- Institute of Mathematics of the National University of Mexico undergraduate Award and fellowship (1986-1988).

Member of the following scientific societies: AMS, SIAM, MAA, INFORMS, and MOS.

Visiting Positions and and Memberships: Long-term visiting researcher at the following research institutions:

- Institute for Mathematics and its Applications, Univ. of Minnesota

- Newton Institute for Mathematical Sciences, Cambridge University, UK.

- Technische Universität München, Germany.

- Institute for Pure and Applied Mathematics, UCLA.

- Universität Magdeburg, Germany.

- Swiss Federal Institute ETH-Zürich, Switzerland.

- Mathematical Science Research Institute, Berkeley USA.

- Universidad de Cantabria, Spain.

- CINVESTAV-Instituto Politécnico Nacional, Mexico.

Teaching & Mentoring:

- Has taught a wide range of undergraduate and graduate classes at the following institutions: Universidad Nacional Autónoma de México, Cornell University, University of Minnesota, ETH Zürich, University of California, Davis, Technische Universität München.

- **Ph.D students:**

  Maya Ahmed (2004, now working in software industry in India),

  Ruriko Yoshida (2004, now at U. Kentucky tenured),

  Tyrrell McAllister (2006, now at U. Wyoming, tenured),

  Susan Margulies (2008, now at US Naval Academy, tenured),

  David Haws (2009, now at IBM Research science staff),

  Edward D. Kim (2010, now at U. Wisconsin Lacrosse, tenured),

  Mohamed Omar (2011, now at Harvey Mudd College, tenure-track)

  Yvonne Kemper (2013, now at Austrian Institute of Technology)

  Brandon Dutra (2016, now at Google)

  Reuben La Haye (2016, now at Google)

Jacob Miller (2016, now at All State insurance)

Jamie Haddock (2018, now at UCLA Center for Applied Math.)

Lily Silverstein (ongoing, passed Qualifying exam, Ph.D expected June 2019)

Thomas Hogan (ongoing, passed Qualifying exam, Ph.D expected 2020)

- **Master Students**

  Pritpal Singh 2002

  Jerry De Groot 2002

  Tom Brounstein 2012

  Mark Junod 2013

  Rebecca Starr 2014

  Michael Pernpeintner 2014 (at Technical Univ. Munich)

- **Postdoctoral Fellows:**

  Dr. Raymond Hemmecke (now at Heureka Business GmbH)

  Dr. Ruchira Datta (now at UC San Francisco)

  Dr. Matthias Köppe (now at UC Davis, full professor)

  Dr. Fu Liu (now at UC Davis, associate professor)

  Dr. Peter Malkin (now at Billington Inc. Australia)

  Dr. Steve Klee (now at Seattle University, associated professor)

  Dr. Steffen Borgwardt (now at Univ. Colorado, Denver, assistant prof. tenure-track)

  Dr. Elisabeth Finhold (now at Fraunhofer Institute for Industrial Mathematics)

  Dr. Chris O'Neill (now at San Diego State Univ, assistant prof. tenure-track)

  Dr. Anastasia Chavez (currently at UC Davis, NSF and UC Presidential fellow)

- **Undergraduate students** Just at UC Davis I have had more than 60 undergraduates conduct research under his supervision (with close to half of them going to graduate school afterwards or finishing and undergraduate honors thesis). At UC Davis alone he has supervised the work projects of the following students (those that went to graduate school marked with schools names, senior thesis with asteriks):

  Amber Johnston, Cynthia Miranda* (CSU Long Beach), Marisa Garcia, Natasha Slepoy* (Columbia Univ), Jon Brooks, Jeremiah Tauzer* (Purdue U.), Peter Huggins* (UC Berkeley), David Haws* (UC Davis), Austin Shapiro* (Univ. Michigan), Michael Zhang, Esteban Pauli* (U. Illinois Urbana), Carol Hshi, David Karapetyan* (USC), Katherine Stalder* (Stanford), Creed Erickson* (UC Davis), Luis de la Torre* (Northwestern U), Tia Baker, Servando Narvaez * (UC Berkeley), Allison O'Hair* (MIT), Matthew Vicksell, Karla Lanzas* (San Francisco State), Rex Cheung* (UC Davis),

Nancy Tafolla* (San Diego Univ.), Courtney Dostie, Katherine Burggraf, Brandon Dutra* (UC Davis), Timothy Ingram* (Stanford), Samantha Cappozo, Jianqiu Wu* (Rice U.), Stanislav Moreinis* (Stanford), Gregory Pinto, Ying Shi* (UC Berkeley), Longphi Nguyen* (UC Davis), Yuan Yuan Shen* (Stanford), Laila Rizvi, Connor Duthie, Victor Fuentes*(Univ. Michigan), Jacqueline Rodriguez* (UCLA), Hanna Polterock, Melody Molander (Univ. of Oklahoma), Emily Macway (UC Santa Barbara), Brendon Verissimo, Samuel Asher, Corina Putinar, Miguel Gil (San Jose State), Carmen Galaz (UC Santa Barbara), Leonardo Ferrer (UC Davis), Alberto Flores Alicia Figueroa, Maya Nelson, Megan Liska* (Georgetown Univ), Jianping Pan (UC Davis), Kevin Sumner*, Benjamin Bairrington*, Li Li (Univ. of Washington), Sean O'Cleary, Morgan Imel, Arina Ushakova (UC Davis), Trevor Chan* (UC Davis), Jenette Sellin (Friedrich Schiller Univ. Germany), Mengda Xu*(CMU), Matthew Corbelli, Santiago Rodriguez, Alondra Horta, and Dominic Yang* (UCLA), Lingyun Ye, Yuanbo Li*, Zekai Zhao*, Maira Hurtado, Chutong Wu*, Michi Kirihara*, and Tzu Feng-Leung*.

PROFESSIONAL SERVICE

Editorial and Referee Work:

- Associate Editor for

  - *SIAM Journal of Discrete Math.*
  - *SIAM Journal for Applied Algebra and Geometry,*
  - *Boletín de la Sociedad Matemática Mexicana,.*
  - *Discrete Optimization (until 2014).*

- Co-editor special issue on "Geometric Combinatorics", 148 pages, "Discrete and Computational Geometry" Volume 27, Number 1, 2002.

- Reviewer for Mathematical Reviews, Zentralblatt für Mathematik since 1995.

- Referee for the following institutions and conferences (some multiple times):

The National Science Foundation,	Journal of Combinatorial Theory (A,B),
Journal of the American Mathematical Soc.	Discrete Applied Mathematics,
Discrete and Computational Geometry,	Journal of Pure and Applied Algebra,
Operations Research,	Mathematical Programming (A,B),
American Mathematical Monthly,	Contributions to Discrete Mathematics,
Boletin de la Sociedad Matematica Mexicana,	Advances in Applied Mathematics,
Computational Geometry: Theory and Apps.,	Mathematic of Computation
Journal of Symbolic Computation,	Operations Research Letters,
Journal of Optimization Theory and Apps.	Proceedings of the AMS
Discrete Optimization,	Mathematika,
Journal of Algebraic Combinatorics,	Mathematics of Operations Research,

Advances in Mathematics	Beitrage zur Algebra und Geometrie
SIAM journal of Optimization	Forum of Mathematics
Discrete Mathematics	Arnold Math. Journal
AMS Memoirs	SIAM journal of Applied Algebra & Geometry

IPCO Symposium on Integer Programming and Combinatorial Optimization 1999, 2013
ACM-SIAM symposium in Computational Geometry 1999, 2000, 2001
ACM Symposium on the Theory of Computing 2016.
Springer book series in "Algorithms and Computations in Mathematics",
Formal Power Series and Algebraic Combinatorics 2001.

Conference Organization and Special Service Committees

- Co-Chair, MSRI-Berkeley special semester in "Geometric and Topological Combinatorics" Fall 2017. A semester long program that attracted several dozens of experts and included three workshops.

- Co-chair, Bay Area Optimization BAYOPT2017: From Data to Decisions, UC Davis May 2017, conference in honor of Roger Wets 80th Birthday. 74 participants.

- Lead organizer, MAA Golden Section meeting at UC Davis, February 2016. Meeting attended by over 250 participants.

- Co-organizer discussion panel "What is a Mathematics PhD?" at Joint Math. Meeting Seattle January 2016

- Elected to the Executive Council of the American Mathematical Society (2015-2019).

- Elected member of the American Mathematical Society Council (serving in subcommittee in Education) (2013-2016).

- co-organizer Casa Matematica Oaxaca, *Advances in Discrete Optimization*, November 2015.

- Co-organizer Mathematical Research Communities program Snowbird Utah, June 2014.

- Member scientific program committee special program on *Inverse Moment Problems*, Institute for Mathematical Sciences (IMS) at the National University of Singapore, Singapore, (Nov. 2013-Jan 2014).

- Member scientific program committee "Mexican Conference on Discrete Mathematics and Computational Geometry", Oaxaca Mexico, November 2013.

- Co-organizer, special session on Convexity, Combinatorics and Topology at First Mathematical Congress of the Americas, Guanajuato August 2013

- Co-Chair of the Scientific Committee LAGOS VII, Playa del Carmen, Mexico, April 2013.

- Scientific program committee member IPCO XVI, Valparaiso Chile March 2013.

- Chair "Convexity, Topology, Combinatorics & Beyond, an international workshop", Puerto Vallarta Mexico, October 2011.

- "Workshop on Optimization", Fields Institute, Toronto Canada, September 2011. Program on Discrete Geometry and Applications

- "Conference on Discrete Geometry and Optimization", Fields Institute, Toronto Canada, September 2011. Program on Discrete Geometry and Applications

- "Workshop on Discrete Geometry", Fields Institute, Toronto Canada, September 2011. Program on Discrete Geometry and Applications

- Chair for Workshop "Efficiency of the Simplex Method: Quo vadis Hirsch conjecture?", UC Los Angeles IPAM, January 2011.

- Scientific committee member LATIN 2010 (Latin American Theoretical Informatics), Oaxaca Mexico, April 2010.

- Organizing and Scientific committee MIP 2009 (Mixed Integer Programming), Berkeley, June 2009.

- Scientific committee member and co-organizer "Geometric Combinatorics" Satellite conference of the International Congress of Mathematicians, Alcala de Henares, Spain, 2006.

- co-organizer "Algebraic Techniques for Optimization" SIAM conference on Discrete Mathematics, University of Victoria, British Columbia, 2006.

- Award committee, MAA Beckenbach book award, 2007-2009.

- co-organizer "Inside the Cube: Algebra, Combinatorics, and Geometry", Magdeburg Germany, 2005.

- Scientific program committee member IPCO XI, Berlin Summer 2005.

- co-organizer Oberwolfach workshop on "Ehrhart Quasi-Polynomials", Summer 2004.

- co-organizer AIM workshop on "Algebraic Statistics" Winter 2003.

- Co-Chair, MSRI-Berkeley special semester in "Discrete and Computational Geometry" Fall 2003. A semester long program that attracted several dozens of experts and included three workshops.

- Program committee member ACM-SIAM symposium on Computational Geometry Boston June 2001.

- Co-organizer AMS session of "Algebraic and Geometric Combinatorics" San Francisco 2000.

- Founding member "Bay Area Discrete Math Day", a semi-annual regional meeting, (since 2000 main regional combinatorics meeting in Northern California).

RESEARCH ACTIVITIES

Selected Invited Talks:

- *Plenary Speaker or Keynote Lecturer for large national or international events:*
  - Plenary speaker ""30th RAMP (Operations Research Soc. of Japan) Symposium", Hiroshima, Japan, October 2018.
  - Plenary speaker 2018 FPSAC (Formal Power Series and Algebraic Combinatorics) Dartmouth College. July 2018.
  - Plenary speaker "Latinx in the Mathematical Sciences", IPAM Conference, March, 2018.
  - Plenary speaker 2017 MAA Golden Section meeting, Cal State East Bay, February 2018.
  - Plenary speaker 2017 MOPTA (Modeling and Optimization: Theory and Applications) Lehigh University, August 2017
  - Keynote speaker 2017 Modern Math Workshop at SACNAS, Salt Lake City Convention Center, Utah, October 2017
  - Plenary speaker 2017 SIAM conference in Applied Algebraic Geometry, Georgia Tech, July 2017.
  - Plenary speaker 2016 USA Mathematics Olympiad Award Ceremony, US State Department, Washington DC June 2016.
  - Plenary speaker 2015 Summer School "Convex Geometry: Discrete and Computational" TU Berlin, June-July 2015.
  - Plenary speaker 2014 West Coast Optimization Meeting, September 2014, Surrey Canada
  - Plenary Speaker MAA southern California section annual meeting, October 2013
  - Plenary Speaker, "Polynomial Optimization", Newton Institute Cambridge UK, July 2013.
  - Plenary Speaker AMS Western Section Meeting Boulder Colorado, April 2013
  - Plenary Speaker Anderson Lecture at the Louisiana Mississippi MAA Section Conference, March, 2014
  - Plenary Speaker, MAA Halmos Distinguished Lecture Series, Carriage House Conference Center, Washington DC September 2012
  - Workshop speaker, "Mixed-Integer Programming 2013", UC Davis, July 2012

– Plenary Speaker Bay Area Discrete Math Day, March 2012

– Plenary Speaker, Triangle Lectures in Combinatorics, Univ. of North Carolina, Chapel Hill, November 2011

– Plenary Speaker Atul Vyas Memorial Lecture, Claremont Mckenna College, November 2011

– Plenary Speaker XX Coloquio Victor Neumann-Lara de Teora de las Grficas, Combinatoria y sus Aplicaciones, Pachuca Mexico, February 2011

– Plenary invited topical speaker SIAM Annual meeting, Pittsburgh, July 12-16, 2010.

– Plenary Speaker, Second Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), Montreal, May 2009

– Plenary speaker, Fourth International Symposium of Combinatorial Computing (4ICC), University of Auckland New Zealand, December 2008.

– Keynote lecturer "Rocky Mountain Mathematics Consortium Summer School: Polyhedral Geometry and Algebraic Combinatorics", Laramie Wyoming, June 20-July 1, 2011.

– Keynote Lecturer, Summer Seminar of the North Central Section of the MAA, St. John's University Minnesota, July 2009

– Plenary speaker DIAMANT/EIDMA symposium Netherlands (2007)

– Plenary speaker MAA Golden Section (CA,NV, HI), annual meeting March (2008), Sacramento, CA

– Plenary Speaker MAA Mathfest, Knoxville Tennessee (2006)

– Plenary Lecturer, IMA Tutorial on "Algebraic Geometric Methods in Engineering", September 2006, IMA Minneapolis MN

– Plenary Lecturer, Doctoral school on: "Optimization over Polynomials and Semidefinite Programming" University of Klagenfurt (Austria), September 2005.

– Plenary Lecturer, International Summer School on Geometric and Algebraic approaches for Integer Programming, University of Lisbon, Portugal, July 2005

– Plenary Speaker, XI Encuentros de Geometria Computacional Santander Spain, June 2005

– Plenary speaker, CBMS conference on *Integer points in Polyhedra: Geometry, Number Theory, Algebra, Optimization* Snowbird Utah (2003)

– Plenary speaker COCOA VIII (computational commutative algebra) Cadiz Spain (2003)

– Plenary speaker conference COMBINATEXAS (2001),

- *Invited Department-wide Colloquium Speaker*

– Colloquium speaker, CORE interdisciplinary seminar, Univ. of Washington Seattle, November 2018.

- Colloquium speaker, Univ. of California Irvine, May 2018.
- Colloquium speaker, Texas State Univ., February 2018
- Colloquium speaker, Clemson University Dept. of Math, January 2018
- Colloquium speaker, North Carolina State Univ, November 2016
- Colloquium Georgia Tech, Atlanta, Feb 2016
- Colloquium Univ., of California Los Angeles, Jan 2016
- Colloquium John Hopkins Univ. November 2015
- Colloquium Technical Univ. of Berlin, October 2015
- Colloquium Claremont Mckenna College, September 2015
- Colloquium Instituto de Matemáticas UNAM, March 2015
- Colloquium University of San Francisco, September 2014
- Colloquium of Illinois Institute of Technology, October 2013
- Colloquium of Technical University of Munich, June 2013
- Colloquium Applied and Computational Mathematics, October 2012
- Colloquium George Mason University, September 2012
- Colloquium George Washington University DC, September 2012
- Colloquium, Operations Research Center Colloquium, MIT, September 2008
- Colloquium of Rice University Computational Applied Math Dept. April 2008.
- Colloquium Speaker, Sonoma State Univ., April 2008
- Colloquium speaker Dept. of Applied Mathematics, MIT (2006),
- Colloquium speaker Technische Universität Berlin, December 2004),
- Colloquium speaker Dept. of Mathematics Univ. of California Berkeley (2003),
- Colloquium speaker Dept. of Mathematics, Santa Clara Univ, March (2003)
- Colloquium speaker Dept of Mathematics, UC Santa Cruz, October (2003)
- Colloquium speaker Dept. of Computer Science, Hong Kong University (2002),
- Colloquium speaker Dept. of Operations Research and Industrial Engineering UC Berkeley (2000)
- Colloquium speaker, Dept. of Mathematics, Purdue University Lafayette (1998)
- Colloquium speaker, Courant Institute of Mathematical Sciences New York (1998)

- *Invited Workshop Speaker*

  - Workshop speaker "Combinatorial Geometries 2018: matroids, oriented matroids and applications", CIRM, Marseille-Luminy, France September 2018.
  - Workshop speaker, " Lattice Polytopes", Einstein Foundation, Berlin, December 2016.

- Workshop speaker ""Polyhedral geometry and partition theory" American Institute of Mathematics, November 2016.
- Workshop speaker "Transversal, Helly and Tverberg type Theorems in Geometry, Combinatorics and Topology III," Casa Matematica Oaxaca BIRS, October 2016.
- Workshop speaker "Discrete Optimization" Forschung Institut Mathematik, ETH Zurich. August 22-26, 2016.
- Workshop speaker Oberwolfach "Topological and Algebraic Combinatorics", February 2015
- Workshop speaker IMA "Enumerative and Geometric Combinatorics", November 2014.
- Workshop speaker AMS Special Session on Polyhedral Number Theory, October 2014
- Workshop speaker "Recent Advances in Linear Optimization", Paris, July 2014
- Workshop speaker "SIAM optimization annual meeting, San Diego California May 2014
- Workshop speaker "Optimization, Moment problems and geometry", Singapore, November 2013
- Workshop speaker Clifford Lectures, Tulane University, March 2010
- Workshop speaker AIM workshop on " Convex algebraic geometry, optimization and applications"
- Workshop speaker AIM workshop on "Combinatorial challenges in toric varieties", April 2009,
- Invited speaker, workshop High Performance Optimization Techniques (HPOPT), Tilburg Netherlands, June 2008.
- Workshop speaker, "Mixed-Integer Nonlinear Optimization: Algorithmic Advances and Applications", IMA Minnesota, November (2008)
- Workshop Speaker, "Polyhedral Computation", October, 2006, Centre de Recherche Mathematique, Montreal Canada
- Workshop speaker, "Convex Sets and their Applications", International Research Station, Banff, Canada (2006)
- Workshop speaker, "Algorithmic, Combinatorial and Applicable Real Algebraic Geometry", MSRI Berkeley, April 2004
- Workshops speaker, "Connections in Mathematics", Society for the Advancement of Chicano and Native Americans in Science, October 2003

- *Invited seminars presented at the following universities and conference centers:*

  Dept of Mathematics, Beijing University, China (6,2017) Dept of Mathematics, Northwestern Univ, Xi'an China (6/2017) Dept of Mathematics, UC Berkeley (Applied Algebra-seminar) (4/2017) Dept. of Electrical Engineering, Univ. Liege Belgium

(12/2016) Hausdorff Institute for Mathematics, Univ. of Bonn, Germany (2015) Instituto de Matemáticas, Univ. de Sevilla, Spain (2014) Dept. of Industrial and Systems Engineering, Georgia Tech (2014) Combinatorics seminar, Georgia Tech (2014) Combinatorics Seminar, Caltech (2012), National Institute of Standards and Technology (2012), Combinatorics Seminar MIT (2000), Combinatorics Seminar UC Berkeley (2000,2003, 2004,2008), Combinatorics Seminar Univ. of Washington (2010), Combinatorics Seminar, Univ of Illinois Urbana-Champaign (1998), Operations Research & Industrial Engineering UC Berkeley (2012), Algebra-Combinatorics Seminar San Francisco State Univ. (2003,2005,2006), Combinatorics seminar, Texas A & M Univ. (2007) IBM T.J Watson Research Center, NY (2007), School of Business, Operations Research Seminar, Univ. British Columbia, Canada, (2007) School of Computer Sciences McGill University Canada, CINVESTAV Mexico (1999), Univ. of Tokyo Japan (2005), Universidad Tecnica de Lisboa, Portugal (2005) Universidad Complutense Spain (2000), University of Rome Italy (2005), University of Crete Greece (2005), CWI-Amsterdam, Netherlands (2004), Universität Osnabruck Germany(2005), Technische Universität Darmstadt (2005), Universität Marburg Germany (2005), Mathematisches Institut Oberwolfach Germany (1995,2000,2005,2007,2008,2010,2012) Freie Univ. Berlin Germany (2013), Technische Univ. Berlin Germany (2004), Univ. Magdeburg Germany (2004, 2005, 2013) ETH Zürich Switzerland (1999, 2005), Oxford University UK (1996), International Centre for Theoretical Physics Trieste Italy (1994),

Grants & Research Funding:

- NSA grant (2015-2016).

- NSF-DMS personal grant (2000-to-2014, 2016-2019).

- CONACYT-UC MEXUS grant (2013-2015).

- Lead PI, NSF VIGRE grant 2007-2013 for the UC Davis math department (3.3 Million dollars).

- Co-PI of NSF VIGRE grant 2002-2007 for the department of Mathematics.

- IBM collaborative grant, *non-standard techniques in integer optimization* (2006-2010).

- Co-PI for GAAN grant (2000-to date).

- Four NSA grants to support scientific workshops.

- Three NSF grants for scientific workshops.

- CNRS-University of California, *Computer Algebra techniques in Optimization*, Berkeley Fund Award. (2001-2002). Co-PI András Sebö.

- Swiss Federal grant *Optimization in the space of subdivisions of a polyhedron* (1998-1999). Co-PI Jürgen Richter-Gebert.

ALL SCHOLARLY PUBLICATIONS
Books

(1) (with F. Santos and J. Rambau) "Triangulations: Structure for Algorithms and Applications", No. 25 of the series "Algorithms and Computation in Mathematics" Springer Verlag, 2010, 545 pages.

(2) (with R. Hemmecke and M. Köppe) Algebraic and Geometric ideas in Discrete Optimization, volume 14 in SIAM-MOS series on Optimization books. SIAM 2013, ISBN 978-1-61197-243-6, pp. I-XIX, 322 pages.

Refereed Articles (Published or to Appear only)

(1) (with B. Sturmfels, and R. R. Thomas), "Gröbner bases and triangulations of the second hypersimplex", *Combinatorica.* 15, (3), 1995, 409-424.

(2) "Gröbner bases and graph colorings", *Beiträge zur Algebra und Geometrie.* 36, (1), 1995, 89-96.

(3) "Non-regular triangulations of product of simplices", *Discrete and Computational Geometry.* 15, 1996, 253-264.

(4) (with F. Santos), "An effective version of Pólya's theorem on positive definite forms", *Journal of Pure and Applied Algebra.*, 108, 1996, 231-240.

(5) (with S. Hoşten F. Santos and B. Sturmfels), "The polytope of all triangulations of a point configuration", *Documenta Mathematica J. DMV.*, 1, 1996, 103-119.

(6) (With F. Wicklin) " On the need of convexity in Patchworking", *Advances in Applied Mathematics* 20, 1998, 188-219.

(7) (with F. Santos and J. Urrutia), "The number of geometric bistellar flips of a triangulation", *Discrete and Computational Geometry*, 21, No.1, 1999, 131-142.

(8) (with W. Morris), "Q-matrix recognition via secondary and universal polytopes", *Mathematical Programming*, 85, 259-276 (1999).

(9) (with C. Athanasiadis, V. Reiner and F. Santos), " Fiber Polytopes for the projections of cyclic polytopes.", *European Journal of Combinatorics* 21, No. 1, 2000, 19–47.

(10) (with A. Below and J. Richter-Gebert) " Finding minimal triangulations of convex 3-polytopes is NP-hard", Research Announcement in *Proc. of the eleventh Symposium of Discrete Algorithms* San Francisco, 2000, 65-66.

(11) (with F. Wicklin), "Viro's patchworking disproves Ragsdale's conjecture", **Videotape** (10 minutes) and short expository article *Proceedings of the sixteenth annual ACM-SIAM Symposium on Computational Geometry*, Hong Kong, 2000, 371-372.

(12) (with A. Below, U. Brehm and J. Richter-Gebert), "Minimal simplicial dissections and triangulations of convex 3-polytopes", *Discrete and Computational Geometry* 24, 2000, 35-48.

(13) (with F. Santos and F. Takeuchi) "Extremal properties of optimal dissections of convex polytopes" *SIAM Journal of Discrete Mathematics* 14, No.2, 2001, 143-161.

(14) (with A. Below and J. Richter-Gebert), "The complexity of finding small triangulations of convex 3-polytopes", J. Algorithms 50(2): 134-167 (2004)

(15) (with B. Sturmfels) "Algebraic Unimodular Counting" in *Mathematical Programming B*. Special issue in "Algebraic and Topological Techniques in Discrete Optimization" Math. Program. 96(2): 183-203 (2003).

(16) (with E. Peterson and F. Su) "A Polytopal Generalization of Sperner's lemma" *Journal of Combinatorial Theory (A)*, 100: 1–26, (2002)

(17) (with M. Ahmed and R. Hemmecke) "Polyhedral Cones for Magic Cubes and Squares" in "New directions in Combinatorial Geometry: The Goodman-Pollack Festschrift volume" (edited by Aronov et al), Springer, 2003, 25–41.

(18) (with S.Onn), "The complexity of 3-way statistical tables", *SIAM J. of Computing.* 33, No. 4, 819–836, 2004.

(19) (with D.Haws, R. Hemmecke, P. Huggins, B. Sturmfels, R. Yoshida) "Short rational functions for toric algebra and its applications" *Journal of Symbolic Computation*, 38, 2004, 959–973.

(20) (with D.Haws, R. Hemmecke, P. Huggins, R. Yoshida) "Three kinds of Integer Programming Algorithms based on Barvinok's rational functions" in proceedings *Tenth International Conference in Integer Programming and Combinatorial Optimization, New York NY, June 2004* Lecture Notes in Computer Science, Vol 3064, 244–255.

(21) (with S. Onn) "All rational polytopes are transportation polytopes and all polytopal integer sets are contingency tables" in proceedings *Tenth International Conference in Integer Programming and Combinatorial Optimization, New York NY, June 2004* Lecture Notes in Computer Science, Vol 3064, 338–351.

(22) (with W. Baldoni-Silva and M. Vergne) "Counting integer flows in networks" *Foundations of Computational Mathematics*, vol. 4, 2004, 277–314.

(23) (with R. Hemmecke, J. Tauzer, and R. Yoshida) "Effective lattice point counting in rational convex polytopes." Journal of Symbolic Computation, vol. 38 no. 4 (2004), 1273–1302.

(24) (with T. McAllister) "Vertices of Gelfand-Tsetlin polytopes" *Discrete and Computational Geometry*, vol 32, No. 4, (2004), 459–470.

(25) (with M. Beck, M. Develin, J. Pfeifle, R.P. Stanley) "Coefficients and zeroes of Ehrhart polynomials". in Integer points in polyhedrageometry, number theory, algebra, optimization, Contemp. Math. 374, Providence, RI: Amer. Math. Soc., pp. 1536, MR 2134759.

(26) (with S. Onn) "Markov bases of 3-way tables are arbitrarily complicated" *Journal of Symbolic computation* 41:173–181, 2006.

(27) (with L. Bowen, M. Develin and F. Santos) "The Gromov norm of the product of two surfaces" *Topology*, 44, (2005), 321–339.

(28) "The many aspects of counting lattice points in polyhedra" *Mathematische Semesterberichte* (2005) 52: 175–195.

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   Part I: intro to algorithms for cones, volumes, lattice points, etc

SOFTWARE

The original *LattE* was first developed in 2001 as C++ software to study lattice points of convex polytopes, primarily counting them and computation of Ehrhart functions (see paper (23)). The algorithms used combinations of geometric and symbolic computation. The key data structures are rational generating functions and cone decompositions. It was the first ever implementation of Barvinok's algorithm. The latest *Latte Integrale 1.7.2* incorporates the ability to integrate a polynomial over a polytope.

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