

Luis David García Puente

Department of Mathematics and Computer Science
Colorado College
Colorado Springs, CO, 80903

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<https://luisgarciapuate.github.io>

Professional Preparation

Universidad Nacional Autónoma de México (UNAM)

B.S. Mathematics (with Honors)

Mexico City, México

1999

Virginia Polytechnic Institute and State University

Ph.D. Mathematics

Blacksburg, VA

2004

- Advisor: Reinhard Laubenbacher
- Dissertation: Algebraic Geometry of Bayesian Networks

University of California, Berkeley

Postdoctoral Fellow

Berkeley, CA

Summer 2004

- Mentor: Lior Pachter

Mathematical Sciences Research Institute (MSRI)

Postdoctoral Fellow

Berkeley, CA

Fall 2004

- Mentor: Bernd Sturmfels

Texas A&M University

Visiting Assistant Professor

College Station, TX

2005 – 2007

- Mentor: Frank Sottile

Appointments

Colorado College

Department Chair of Mathematics and Computer Science

Colorado Springs, CO

2023 –

Colorado College

Professor of Mathematics and Computer Science

Colorado Springs, CO

2021 –

Sam Houston State University

Professor of Mathematics

Huntsville, TX

2019 – 2021

Sam Houston State University

Associate Department Chair

Huntsville, TX

Fall 2017 – 2021

Sam Houston State University

Associate Professor of Mathematics

Huntsville, TX

2013 – 2019

Statistical and Applied Mathematical Sciences Institute

SAMSI New Researcher fellowship

Research Triangle Park, NC

Spring 2009

Sam Houston State University

Assistant Professor of Mathematics

Huntsville, TX

2007 – 2013

Virginia Bioinformatics Institute (Virginia Tech)

Graduate Research Assistant

Blacksburg, VA

Spring 2004

Virginia Polytechnic Institute and State University
Graduate Teaching Assistant

Blacksburg, VA
2002 – 2003

University of Genova
Research Fellow

Genova, Italy
Fall 2002

– Mentor: Lorenzo Robbiano

Physical Science Laboratory (New Mexico State University)
Graduate Research Fellow

Las Cruces, NM
Summer 2000

New Mexico State University
Graduate Teaching Assistant

Las Cruces, NM
1999-2001

Universidad Nacional Autónoma de México (UNAM)
Ayudante de Profesor tipo A (Teaching Assistant)

Mexico City, Mexico
1997-1998

Research Interests

Algebraic Statistics, Applied and Computational Algebraic Geometry, Algebraic Combinatorics

Honors and Awards

American Mathematical Society
Fellow of the American Mathematical Society

2022 Class

Lathisms: Latin@s and Hispanics in the Mathematical Sciences
Featured Mathematician in honor of the Hispanic Heritage Month

Notices of the AMS
October 2016

Sistema Nacional de Investigadores
Investigador Nacional Nivel I

Consejo Nacional de Ciencia y Tecnología, México
2015 – 2017

Sociedad Matemática Mexicana
Sotero Prieto Award

México
1999

– Nationwide honor awarded for the best undergraduate mathematics thesis of the year awarded by the Mexican Mathematical Society.

Grants

National Science Foundation DMS
Award Number: 2419363

\$22,500.00
2024

– PI in the proposal “Conference: Workshop on Computational and Applied Enumerative Geometry.”

Colorado College 2023 Open Education Curriculum Development Grant

\$2,000.00

Colorado College 2022 Summer Student Collaborative Research (SCoRe) Grant

\$8,000.00

– PI in the proposal “Exploring small Ramsey numbers.”

Colorado College 2022-2023 Faculty Scholarship Development Teaching-Release Block Award
2020 American Institute of Mathematics SQuaRE program

- AIM SQuaRE project on “Algebraic Geometry of Chemical Reaction Networks.” SQuaRE members: Elizabeth Gross, Heather A. Harrington, Nicolette Meshkat, Anne Shiu, and Luis David García Puente

- American Mathematical Society Travel Grant** \$1,350.00
 - Travel grant to attend the 2017 Mathematical Congress of the Americas in Montréal, Canada.

- SHSU EURECA’ Summer 2017 Faculty and Student Team (FAST) Award** \$8,000.00
 - PI in the proposal “Computational Algebraic Geometry Applications to Theoretical Neuroscience.”

- SACNAS Mini-Collaboration Grant** \$3,135
 - Funded through award DMS 1643235 (PI: Pamela E. Harris and Shannon Talbott).

- National Science Foundation DMS - Combinatorics** \$5,650.00
Award Number: 1633874 2016
 - Co-PI in the proposal “CombinaTexas 2016: A South-Central Combinatorics Conference.”

- 2015–2017 American Institute of Mathematics SQuaRE program**
 - AIM SQuaRE project on “Ideals in algebraic systems biology.” SQuaRE members: Elizabeth Gross, Heather A. Harrington, Nicolette Meshkat, Anne Shiu, and Luis David García Puente

- National Science Foundation DMS - Mathematical Biology** \$15,000.00
Award Number: 1503562 2015
 - Co-PI in the proposal “ACSB 2015: A Conference on Algebraic and Combinatorial Approaches in Systems Biology.”

- National Security Agency Research Experience for Undergraduates** \$58,530.00
Award Number: H98230-14-1-0131 2013
 - Co-PI in the proposal “Pacific Undergraduate Research Experience in Mathematics.”

- 2013 Simons Foundation Collaboration Grants for Mathematicians** \$35,000.00
Award Number: 282241 2013
 - PI in the proposal “Applied Algebraic Geometry.”

- Institute for Computational and Experimental Research in Mathematics** \$1,600.00
 - ICERM travel grant to attend the 2013 Modern Math Workshop and the 2013 SACNAS National Conference in San Antonio, TX. October 2013. (approx. amount.)

- 2013 American Mathematical Society Travel Grant** \$1,600.00
 - Travel grant to attend the 2013 Mathematical Congress of the Americas in Guanajuato, Mexico.

- SHSU Faculty Research Grant (FRG) 2012** \$5,000.00
 - PI in the proposal “Rational Linear Precision of Toric Bézier Volumes.”

- NSF Conferences and Workshops in the Mathematical Sciences** \$9,110.00
DMS-1101781 Accepted 2010
 - PI in the proposal “CombinaTexas 2011: A two-day conference focusing on algebraic combinatorics.”

- NSA Mathematical Sciences Program – Conferences and Special Situations** \$10,000.00
Grant #22050 2011
 - co-PI in the proposal “CombinaTexas 2011: A two-day conference focusing on algebraic combinatorics.”

- NSF Travel Award (administered by the University of Alaska Fairbanks)** \$2,000.00
- Travel award to support attendance to the Kickoff Workshop on Algebraic Geometry in the Sciences at the Centre of Mathematics for Applications, University of Oslo, Norway.
- 2007 Norman Hackerman Advanced Research Program (ARP)** \$144,000.00
grant no. 010366-0054-2007 2008 – 2010
- Collaborative project with Frank Sottile entitled “Applications of Algebraic Geometry to Algebraic Statistics and Geometric Modeling.”
- Internal Texas A&M University Grant** 2006
- Awarded in support of the proposal “Mathematical Foundations for Probabilistic Boolean Networks” submitted to the Career Awards at the Scientific Interface program of the Burroughs Wellcome Fund.

Publications

1. Maize Curiel, Elise Farr, Galileo Fries, Luis David García Puente, Julian Hutchins, and Vuong Nguyen Hoang. Positive steady-state varieties of small chemical reaction networks. Submitted to *Involve*.
2. Luis David García Puente, Elizabeth Gross, Heather A. Harrington, Matthew Johnston, Nicolette Meshkat, and Anne Shiu. Absolute concentration robustness: Algebra and geometry. Submitted to *Journal of Symbolic Computation*. <https://arxiv.org/pdf/2401.00078.pdf>
3. Shishir Agrawal, Luis David Garcia Puente, Minho Kim, Flavia Sancier-Barbosa. Using Exact Tests from Algebraic Statistics in Sparse Multi-way Analyses: An Application to Analyzing Differential Item Functioning. Submitted to *The American Statistician*.
<https://arxiv.org/pdf/2312.12638.pdf>
4. Luis David García Puente, Marina Garrote-López, Elima Shehu. Computing algebraic degrees of phylogenetic varieties. *Algebraic Statistics* Vol. 14 (2023), No. 2, 215-231. DOI: 10.2140/astat.2023.14.215. <https://msp.org/astat/2023/14-2/p05.xhtml>
5. Carlos Améndola, Luis David García Puente, Roser Homs, Olga Kuznetsova, Harshit Motwani. Computing maximum likelihood estimates for Gaussian graphical models with Macaulay2. *Journal of Software for Algebra and Geometry* Vol. 12 (2022), 1-10. DOI: 10.2140/jsag.2022.12.1 <https://msp.org/jsag/2022/12-1/p01.xhtml>
6. Kassie Archer, Abigail Bishop, Alexander Diaz-Lopez, Luis David García Puente, Darren Glass, Joel Louwsma. Arithmetical structures on bidents. *Discrete Mathematics*. Volume 343, Issue 7, July 2020, 111850. <https://doi.org/10.1016/j.disc.2020.111850>
7. Benjamin Braun, Hugo Corrales, Scott Corry, Luis David García Puente, Darren Glass, Nathan Kaplan, Jeremy L. Martin, Gregg Musiker, and Carlos E. Valencia. Counting arithmetical structures on paths and cycles. *Discrete Mathematics* Volume 341, Issue 10, October 2018, Pages 2949–2963. <https://doi.org/10.1016/j.disc.2018.07.002>
8. Rebecca Garcia, Luis David García Puente, Ryan Kruse, Jessica Liu, Dane Miyata, Ethan Petersen, Kaitlyn Phillipson, and Anne Shiu. Gröbner bases of neural ideals. *International Journal of Algebra and Computation*. Vol. 28, No. 04, pp. 553–571 (2018)
<https://doi.org/10.1142/S0218196718500261>

9. David Kahle, Ruriko Yoshida, and Luis Garcia-Puente. Hybrid schemes for exact conditional inference in discrete exponential families. *Ann Inst Stat Math* **70**, 983–1011 (2018).
<https://doi.org/10.1007/s10463-017-0615-z>
10. Ethan Petersen, Nora Youngs, Ryan Kruse, Dane Miyata, Rebecca Garcia, Luis David García Puente (2018) *Neural Ideals in SageMath*. In: Davenport J., Kauers M., Labahn G., Urban J. (eds) *Mathematical Software – ICMS 2018*. ICMS 2018. Lecture Notes in Computer Science, vol 10931. Springer, Cham. https://doi.org/10.1007/978-3-319-96418-8_22
11. Carlos Améndola, Marta Casanellas, Luis David García Puente. Tapas of Algebraic Statistics. *Notices of the American Mathematical Society* Volume 65, Number 8, September 2018, Pages 936–938. <https://www.ams.org/journals/notices/201808/rnoti-p936.pdf>
12. Demara Austin, Megan Chambers, Rebecca Funke, Luis David García Puente and Lauren Keough. The multivariate avalanche polynomial. *The Australasian Journal of Combinatorics*. Volume **72(3)** (2018), Pages 421–445. https://ajc.maths.uq.edu.au/pdf/72/ajc_v72_p421.pdf
13. Luis David Garcia-Puente. Multisided toric Bézier patches. In *Multivariate Splines and Algebraic Geometry* (organized by H. Schenck, L. Schumaker and T. Sorokina). Oberwolfach Reports. Volume **12**, Issue 2, 2015, pp. 1139–1200. Part of DOI: <https://doi.org/10.4171/owr/2015/21>
14. Paola Vera-Licona, Abdul Jarrah, Luis David Garcia-Puente, John McGee, and Reinhard Laubenbacher. An algebra-based method for inferring gene regulatory networks. *BMC Systems Biology* 2014, **8**:37. Ranked as a '**Highly accessed**' article.
<https://doi.org/10.1186/1752-0509-8-37>
15. Luis David García-Puente, Sonja Petrović, and Seth Sullivant. Graphical Models. *The Journal of Software for Algebra and Geometry* **5** (2013), 1–7. <https://doi.org/10.2140/jsag.2013.5.1>
16. Scott Chapman, Rebecca Garcia, Luis David García-Puente, Martin E. Malandro, and Ken W. Smith. Algebraic and combinatorial aspects of sandpile monoids on directed graphs. *Journal of Combinatorial Theory, Series A* **120** (2013) 245–265.
<https://doi.org/10.1016/j.jcta.2012.08.001>
17. Luis David García-Puente, Nickolas Hein, Christopher Hillar, Abraham Martín Del Campo, James Ruffo, Frank Sottile, and Zach Teitler. The secant conjecture in the real Schubert calculus. *Experimental Mathematics*, 21:3, (2012) 252–265.
<https://doi.org/10.1080/10586458.2012.661323>
18. Luis David García-Puente, Frank Sottile, and Chungang Zhu. Toric degenerations of Bézier patches. *ACM Transactions on Graphics*, Vol. 30, No. 5, Article 110, October 2011.
<https://doi.org/10.1145/2019627.2019629>
19. Elena Dimitrova, Luis David García-Puente, Franziska Hinkelmann, Abdul S. Jarrah, Reinhard Laubenbacher, Brandilyn Stigler, Michael Stillman, and Paola Vera-Licona. Parameter estimation for Boolean models of biological networks. *Special Issue on Foundations of Formal Reconstruction of Biochemical Networks. Theoretical Computer Science*, **412/26**, pp. 2816–2826. (2011).
<https://doi.org/10.1016/j.tcs.2010.04.034>
20. Christopher Hillar, Luis García-Puente, Abraham Martín Del Campo, James Ruffo, Zach Teitler, Stephen L. Johnson, and Frank Sottile. Experimentation at the Frontiers of reality in Schubert calculus. *Gems in Experimental Mathematics, AMS Contemporary Mathematics*, **517**, 2010, 365–380. Part of ISBN: <https://www.worldcat.org/isbn/9780821848692>

21. Luis D. García-Puente, Sarah Spielvogel, and Seth Sullivant. Identifying causal effects with computer algebra. P. Grünwald and P. Spirtes (Editors). *Proceedings of the 26th Conference of Uncertainty in Artificial Intelligence (UAI 2010)*. AUA Press (2010).
https://event.cwi.nl/uai2010/papers/UAI2010_0087.pdf
22. Luis David Garcia-Puente, Frank Sottile. Linear precision for parametric patches. *Advances in Computational Mathematics*, **33/2** (2010) pp. 191–214.
<https://doi.org/10.1007/s10444-009-9126-7>
23. Gheorghe Craciun, Luis David García-Puente, and Frank Sottile. Some geometrical aspects of control points for toric patches. *Mathematical Methods for Curves and Surfaces 2008 (M. Dæhlen et al. Eds). Lecture Notes in Computer Science* **5862**, pp. 111–135. Springer, Heidelberg (2010). Part of ISBN: <https://www.worldcat.org/isbn/9783642116209>
24. Maria A. Aviño-Díaz, Luis D. Garcia-Puente. Computing the additive structure of indecomposable modules over Dedekind-like rings using Gröbner bases. in *Journal of Algebra and Its Applications*, **6/2** (2007) pp. 291-304. <https://doi.org/10.1142/s0219498807002211>
25. Luis David Garcia, Abdul Salam Jarrah, and Reinhard Laubenbacher. Sequential dynamical systems over words. *Applied Mathematics and Computation*, **174/1** (2006) pp. 500-510.
<https://doi.org/10.1016/j.amc.2005.04.101>
26. Luis David Garcia, Michael Stillman, and Bernd Sturmfels. Algebraic geometry of Bayesian networks. *Journal of Symbolic Computation*, **39/3–4** (2005) pp. 331–355. Special issue on the occasion of Mega 2003. <https://doi.org/10.1016/j.jsc.2004.11.007>
27. Marta Casanellas, Luis David Garcia, and Seth Sullivant. Catalog of small trees. In *Algebraic Statistics for Computational Biology*, (L. Pachter and B. Sturmfels Eds.) Cambridge University Press, (2005) pp. 291–304. <https://doi.org/10.1017/cbo9780511610684.019>
28. Luis David Garcia. Algebraic Statistics in model selection. M. Chickering and J. Halpern, editors, *Proceedings of the 20th Conference of Uncertainty in Artificial Intelligence*, (2004) 177–184.
<https://dl.acm.org/doi/10.5555/1036843.1036865>
29. Luis David García Puente. Bases de Gröbner asociadas a módulos finitos. *Miscelánea Matemática (MMS)* **30** (2000), pp. 65–70. Part of ISSN:
<https://portal.issn.org/resource/ISSN/1665-5478>

Media Appearances

- (1) Featured mathematician as part of the American Mathematical Society' Lathisms project:
<http://www.lathisms.com>. The AMS initiated this project to provide an accessible platform that features prominently the extent of the research and mentoring contributions of Latin@s and Hispanics in different areas of the Mathematical Sciences.
- (2) Recorded a video on sandpiles for the Numberphile project.
<https://www.youtube.com/watch?v=1MtEUErz7Gg>. Currently this video has more than 500,000 views. Numberphile is a project supported by the Mathematical Sciences Research Institute.

Courses Taught

Colorado College

Colorado Springs, CO

Spring 2024	MA120 Applied Linear Algebra (Block 5) MA117 Probability & Statistics (Block 7)
Fall 2023	MA129 Calculus 2 (Block 3)
Spring 2023	MA129 Calculus 2 (Block 5) MA421 Abstract Algebra 2 (Block 7)
Fall 2022	MA201 Foundations of Discrete Mathematics (Block 2) MA126 Calculus 1 (Block 3)
Spring 2022	MA220 Linear Algebra (Block 6) MA126 Calculus 1 (Block 8)
Fall 2021	MA251 Number Theory (Block 1) MA126 Calculus 1 (Block 3)

Sam Houston State University

Huntsville, TX

Sum. 2021	MATH 1332 - College Mathematics (two online sections)
Spring 2021	MATH 5397 - Discrete Mathematics (two sections)
Fall 2020	MATH 1332 - College Mathematics (online) MATH 6340 - Algebraic Geometry (Section 01)
Sum. 2020	MATH/STAT 3379 - Statistical Methods in Practice (two online sections)
Spr. 2020	MATH 1332 - College Mathematics (online) MATH 2395 - Discrete Mathematics (Section 01)
Fall 2019	MATH 1332 - College Mathematics (online) MATH 4377 - Algebraic Structures (Section 01)
Sum. 2019	MATH 1332 - College Mathematics (two online sections)
Spr. 2019	MATH 1332 - College Mathematics (online) MATH 6340 - Algebraic Geometry (Section 01)
Fall 2018	MATH 1332 - College Mathematics (online) MATH 3377 - Linear Algebra (Section 01)
Sum. 2018	MATH 1332 - College Mathematics (three online sections)
Spr. 2018	MATH 2395 - Discrete Mathematics (Section 01)
Fall 2017	MATH 1332 - College Mathematics (online) MATH 2395 - Discrete Mathematics (Section 01) MATH 6398 - Research and Thesis (Section 01)
Sum. 2017	MATH 1332 - College Mathematics (two online sections)
Spr. 2017	MATH 1332 - College Mathematics (online)
Fall 2016	MATH 1410 - Elementary Functions (Section 02) MATH 2395 - Discrete Mathematics (Section 01) MATH 6335 - Abstract Algebra (Section 01)
Spr. 2016	MATH 1316 - Plane Trigonometry (Section 05) MATH 1430 - Calculus 2 (Section 01) MATH 4370 - Special Topics: Applied Algebra (Section 01)

Fall 2015	MATH 1430 - Calculus 2 (Section 02) MATH 2395 - Discrete Mathematics (Section 01) MATH 4377 - Algebraic Structures (Section 01)
Spr. 2015	MATH 1332 - College Mathematics (Section 10) MATH 4377 - Algebraic Structures (Section 01) MATH 5397 - Discrete Mathematics (Section 01)
Fall 2014	MATH 1332 Honors - College Mathematics (Section 11) MATH 2395 - Discrete Mathematics (Section 01) MATH 6340 - Algebraic Geometry (Section 01)
Spr. 2014	MATH 1332 - College Mathematics (Section 12)
Fall 2013	MATH 1316 Plane Trigonometry (Section 02) MATH 1332 Honors - College Mathematics (Section 15) MATH 1332 - College Mathematics (Section 16)
Spr. 2013	MATH 2395 Discrete Mathematics (Section 01) MATH 6336 Abstract Algebra 2 (Section 01)
Fall 2012	MTH 1316 Plane Trigonometry (Section 02) MTH 1430 Calculus 2 (Section 03) MTH 6335 Abstract Algebra 1 (Section 01)
Spr. 2012	MATH 1430 Calculus 2 (Section 01) MATH 5360 Special Topics: Algebraic Geometry (Section 01)
Fall 2011	MTH 163 Plane Trigonometry (Section 02) MTH 163 Plane Trigonometry (Section 05) MTH 477 Algebraic Structures (Section 01)
Spr. 2011	MTH 142 Calculus 1 (Section 2) MTH 143 Calculus 2 (Section 2) MTH 163 Plane Trigonometry (Section 6)
Fall 2010	MTH 142 Calculus 1 (Section 02) MTH 199 Mathematics for Managerial Decision Making (Sections 03) MTH 597 Discrete Mathematics (Section 01)
Sum. 2010	MTH 163 Plane Trigonometry (Section 03) MTH 164 College Mathematics (Section 04)
Spr. 2010	MTH 142 Calculus 1 (Section 02) MTH 199 Mathematics for Managerial Decision Making (Section 10) MTH 636 Abstract Algebra 2 (Section 01)
Fall 2009	MTH 142 Calculus 1 (Section 03) MTH 677 Abstract Algebra 1 (Section 01)
Sum. 2009	MTH 164 College Mathematics (Section 04) MTH 199 Mathematics for Managerial Decision Making (Section 04)
Fall 2008	MTH 142 Calculus 1 (Section 02) MTH 163 Plane Trigonometry (Section 14) MTH 470W/560 Special Topics: Algebraic Geometry (Section 01)
Sum. 2008	MTH 032 Developmental Mathematics 2 (Section 02)

- MTH 163 Plane Trigonometry (Section 01)
- Spr. 2008 MTH 164 College Mathematics (Sections 07 and 10)
MTH 142 Calculus 1 (Section 05)
- Fall 2007 MTH 164 College Mathematics (Sections 11 and 12)
MTH 376 Differential Equations (Section 01)

University of Hawaii–Hilo

Hilo, Hawaii

- Sum. 2015 EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) course on applied algebraic geometry
- Sum. 2014 EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) course on sandpile groups
- Sum. 2013 EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) course on sandpile models
- Sum. 2011 EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) course on sandpile models

Texas A&M University

College Station, TX

- Sum. 2007 IMA PI Summer Program for Graduate Students on Applicable Algebraic Geometry (Assistant Instructor)
- Spr. 2007 Math 689 Applicable Algebraic Geometry (Section 604 – with Frank Sottile)
- Fall 2006 Math 251 Calculus III (Sections 502 and 506)
- Sum. 2006 Math 662 REU/VIGRE course on Algebraic Methods in Computational Biology (Section 100 – with Maurice Rojas)
- Spr. 2006 Math 308 Differential Equations (Section 512)
- Fall 2005 Math 142 Business Calculus II (Sections 501 and 508)
- Sum. 2005 Math 662 REU/VIGRE course on Algebraic Methods in Computational Biology (Section 100 – with Maurice Rojas and Lenny Fukshansky)
- Spr. 2005 Math 152 Calculus II (Sections 519, 520, 521, 522, 523, and 524)

Virginia Polytechnic Institute and State University

Blacksburg, VA

- Fall. 2003 Math 1205 Calculus I (1 section)
- Spr. 2002 Math 1205 Calculus I (TA in 2 sections)

Dipartimento di Matematica, Università degli Studi di Genova

Genova, Italy

- Fall 2002 Seminar on Algebraic Statistics

University of Puerto Rico–Humacao

Humacao, Puerto Rico

- Sum. 2001 NSF/REU Summer Institute in Mathematics for Undergraduates (Teaching Assistant for Reinhard Laubenbacher)

New Mexico State University

Las Cruces, NM

- 1999–2001 MATH 120 Intermediate Algebra (2 sections)
MATH 190G Trigonometry and Pre–Calculus (2 sections)

Universidad Nacional Autónoma de México

Mexico City, Mexico

1997-1998 Teaching Assistant for the following undergraduate courses: Ciencias de la Computacion I (Introduction to Computer Science I), Ciencias de la Computacion II (Introduction to Computer Science II), Algebra Superior (College Algebra), Algebra Lineal (Linear Algebra).

Mentoring

Undergraduate Students

2024	Iverson Wang (Undergraduate Thesis)
Sum. 2024	Maddy Spark: Research supported through the Colorado College 2024 Summer Student Collaborative Research
2023–2024	Galileo Fries (Undergraduate Thesis)
Sum. 2023	Elise Farr, Galileo Fries, Vuong Nguyen Hoang, Julian Hutchins: Research supported through the 2023 Pomona Research in Mathematics Experience (2023 PRiME)
2022–2023	Casmali Lopez (Undergraduate Thesis), Timothy Somerset (Independent study)
Sum. 2022	Iverson Wang, Haoru Yang: Research supported through the Colorado College 2022 Summer Student Collaborative Research
Spring 2021	Zafer Cesur, Eyobel Gebre, Samuel Gilman: Research conducted as part of a Research Course in Graph Theory taught by Pamela Harris at Williams College.
2018–2019	JJ Hoo (SHSU): Research conducted as part of the MATH 4395 Undergraduate Research in Mathematics course.
Sum. 2017	Alexander Farrack, Justin Jones, Alexander Norman: Research supported through Sam Houston State University EURECA's Summer 2017 Faculty and Student Team (FAST) Award .
Sum. 2016	Carlos Agrinoni Santiago, Diane Christine Alar, Angel Burr, Ernest Castorena, Jonathan Celaya, Anna Comito, Karlie Elliott, Jennifer Garcia, Micah Henson, Cecily Santiago, Ruben Hurtado, Tafari James, Casandra Monroe, Drisana Mosaphir, Dominika Palinko, Maleek Richardson, Justin Rivera, Ricardo Rojas-Echenique: Research supported through the Mathematical Sciences Research Institute - Undergraduate Program (MSRI-UP 2016) .
Sum. 2015	Vanessa Aguirre, Ihmar Aldana, Kainalu Barino, Monica Busser, Iliana De La Cruz, Ryan Kruse, Dane Miyata, Ethan Petersen, Taylor Spino, Melissa Stadt, Catherine Sullivan, Aaron Wagner: Research supported through the EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) Interns program.
Sum. 2014	Demara Austin, Angel Castillo, Megan Chambers, Jeffrey Davis, Rebecca Funke, Elizabeth Herman, Joshua Klarmann, Vince Longo, Amadeus Martin, Bianca Mastache, Bryan Oakley, and Zalia Rojas: Research supported through the EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) Residents program.
Fall 2013	Jay Pruett (SHSU): Supervised an independent study course on Large Social Networks.
Fall 2012	Denise Brown (SHSU): Supervised an Honors Calculus 2 course.

- Sum. 2013 Sarah Baumgardner, Brittany Boribong, Andrew Fry, Cody Kalā, Armando Salinas, Reina Shintaku, Raven Showels, Reuben Tate, Amanda Urquiza, Gautam Webb, Kathreen Yanit, Andrew You: Research supported through the **EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math)** Interns program.
- 2011–2012 Jesse Hering, Everett Meza, and Christina Nieuwoudt (SHSU): Research supported through the **NSF/MCTP Long Undergraduate Research Experience (LURE) program**.
- Sum. 2011 Emily Chang, Yan Dai, Kimberly Emig, Yohan Kim, Tynan Lazarus, Reina Ojiri, Brandon Rivera, Jesse Robert, Akashi Rouse, Kendall Tada, Daisy Vasquez, Jermaine Vitales: Research supported through the **EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math)** Interns program.
- 2008–2010 Alexander Diaz and Sarah Spielvogel (SHSU): Research supported through the 2007 Norman Hackerman Advanced Research Program grant no. 010366-0054-2007.
- 2008–2009 Andrew Howard (SHSU): Research supported through the 2007 Norman Hackerman Advanced Research Program grant no. 010366-0054-2007.
- Fall 2009 Maelani Negrito (SHSU). Supervised an Honors Calculus 1 course.
- Sum. 2006 Hannah Saugier and Stacey Stokes: Research conducted (with Maurice Rojas) during the **REU Summer Program at Texas A&M University**.
- Sum. 2005 Elizabeth Dong, Guangming Lang, and Jacob Porter: Research conducted (with Maurice Rojas) during the **REU Summer Program at Texas A&M University**.

Graduate Students

- Sum. 2023 Maize Curiel (University of Hawai'i at Manoa) Research Assistant supported through the 2023 Pomona Research in Mathematics Experience (PRiME 2023).
- 2020 Ligia Flores (SHSU) MS in Mathematics Independent Research Project: Dynamical system models of *Aspergillus fumigatus* iron regulation and oxidative stress response.
- 2018–2019 Mackenzie Unger (SHSU) MS in Mathematics Independent Research Project: Cyclic sandpile groups of bident complements.
- 2017 Marco Polo Castillo Villalba (Centro de Ciencias Genómicas, UNAM-Cuernavaca). External Ph.D. Committee Member.
- 2017–2018 Chamika Nishan Adimali (SHSU) MS in Mathematics Independent Research Project: Cyclic sandpile groups of almost complete graphs.
Katlin Pinelli (SHSU) MS in Mathematics Independent Research Project: Visualization methods in theoretical neuroscience
Rutger Yager (SHSU) MS in Mathematics Thesis: Algebraic methods in theoretical neuroscience.
- Sum. 2016 Natalie Hobson (University of Georgia) and Jacob Russell-Madonia (City University of New York). Graduate Assistants supported through the Mathematical Sciences Research Institute - Undergraduate Program (MSRI-UP 2016).
- 2016 Merve Karakis (SHSU). MS in Mathematics Independent Research Project in "Algebraic Methods in Theoretical Neuroscience".

- 2015 Alma Kelley (SHSU). MS in Mathematics Independent Research Project in "Toppling polynomial of a sandpile group".
- Sum. 2015 Kaitlyn Phillipson (Texas A&M University). Graduate Assistant supported through the EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) Interns program.
- Sum. 2014 Lauren Keough (University of Nebraska-Lincoln). Graduate Assistant supported through the EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) Residents program.
- 2013–2014 Colin Lawson (SHSU). MS in Mathematics Independent Research Project in "Computational Algebraic Geometry."
- Sum. 2013 Anastasia Chavez (University of California, Berkeley). Graduate Assistant supported through the EMSW21-MCTP Pacific Undergraduate Research Experience in Mathematics (PURE Math) Interns program.
- 2011–2012 Sarah Spielvogel (SHSU). MS in Mathematics Thesis Project entitled "Noether's PhD thesis and computational invariant theory". (jointly with R. Garcia)
- 2011–2012 Luis David Molina (SHSU). MS in Mathematics Thesis Project entitled "Clique sums of sandpile groups".
- 2011–2012 Robert Williams (SHSU). MS in Mathematics Thesis Project entitled "Planar graphs of trivariate monomial ideals".
- 2011 Chandana Abeysinghe (SHSU). MS in Mathematics Independent Research Project in "Algebraic geometry applications in engineering".
- 2010–2011 Alacia Voth (SHSU). Research partially supported through the 2007 Norman Hackerman Advanced Research Program grant no. 010366-0054-2007.
- 2009–2010 Jessica Ellis (SHSU). Research supported through the 2007 Norman Hackerman Advanced Research Program grant no. 010366-0054-2007.
- 2009–2010 Anton Petrov (SHSU). MS in Mathematics Research Project in "Graphical methods for identifiability in structural equation models".
- 2009–2011 Javier Muñoz Bernabé. Member of Ph.D. Dissertation Committee. Department of Mathematics, Cinvestav, Mexico City, México.

Post-doctoral Faculty

- 2023– Postdoctoral Mentor as part of the ASCEND Mentor Network.
- Sum. 2016 Ashley K. Wheeler (University of Arkansas). Post-doctoral mentor supported through the Mathematical Sciences Research Institute - Undergraduate Program (MSRI-UP 2016).

Early Career Faculty

- 2023-2024 Luis Aviles Gonzalez, Martha Poggioli, Ken Scriboni, Catherine Witherspoon. Convener as part of Colorado College's Mentoring Alliance Program.
- 2022-2023 Juan Miguel Arias, Sarah Keleher, Antonio Alves Meira Neto, Diana Norton, Joey Zhao. Convener as part of Colorado College's Mentoring Alliance Program.
- 2016–2017 Joshua Hallam (Wake Forest University). Early Career Faculty Mentor. MAA Mentoring Network.

Sum. 2017 Kassie Archer (University of Texas at Tyler), Abigail Bishop (Iona College), Alexander Diaz-Lopez (Villanova University), Joel Louwsma (Niagara University). Undergraduate Faculty Research Mentor. 2017 ICERM Research Experiences for Undergraduate Faculty (REUF).

Departmental and University Committee Service

Colorado College Mentoring Alliance Program Convener	2022–
Colorado College Curriculum Executive Committee	2022–2023
Colorado College Antiracism Commitment Committee	2021–2023
Colorado College Departmental Outreach Committee	2022–2023
Colorado College Mentoring Alliance Program member	2021–2022
Colorado College Computer Science Hiring Committee	Fall 2022
Colorado College Departmental Website Committee	2021–2022
Colorado College Mathematics VAP Hiring Committee	2021–2022
Colorado College Computer Science Hiring Committee	Fall 2021
SHSU Associate Department Chair	2017–2021
SHSU Hiring Committee	2019–2020
Department of Mathematics and Statistics Policy Committee	2017–2019
B.S. in Mathematics Undergraduate Curriculum Committee	2016–2021
SHSU Math 1332 College Mathematics Textbook Committee	Spring 2019
M.S. in Mathematics Self-Study Committee	2016–2017
SHSU Hiring Committee (Chair)	2014–2015
Assistant M.S in Mathematics Graduate Coordinator	2014–2021
SHSU Hiring Committee for Visiting Assistant Professor	Spring 2014
SHSU Diversity Committee	2012–2015
SHSU Mathematics and Statistics Colloquium Organizer	2012–2016
SHSU College of Science Mission/Vision Committee	Fall 2012
SHSU Hiring Committee for Visiting Assistant Professor	Summer 2012
SHSU Calculus Textbook Committee	Spring 2012
SHSU Hiring Committee	2011–2012
SHSU Graduate Program in Mathematics Committee	2010–2021
SHSU Hiring Committee	2009–2010
SHSU Department of Mathematics and Statistics Library Liaison	2008–2021
SHSU MTH 163 – Trigonometry Textbook Committee	Spring 2008
SHSU MS in Mathematics Revision Committee	2007–2009
SHSU Engineering–Technology Committee (College of Arts and Sciences)	2007–2008

Service to the Academic Community

- Member of the American Mathematical Society Canvassing Committee (2024 –).
- Executive Committee Member, Rocky Mountain Section of the Mathematical Association of America (2023 –).

Editorial, Referee and Review Activities

Editorial Activities

- Associate Editor, Notices of the American Mathematical Society (2025 – 2027)
- Associate Editor, American Mathematical Monthly (2012 – 2018)
- Associate Editor, Journal of Algebraic Statistics (2013 – 2018)
- Contributing Editor, AMS blog On Teaching and Learning Mathematics (2016 – 2017)

Reviewer Activities

- Cambridge University Press
- Mathematical Reviews (since 2007)
- Zentralblatt MATH (since 2007)

Journals refereed

- Advances in Applied Mathematics
- Advances in Numerical Analysis
- Applied Mathematics and Computation
- Bulletin of Mathematical Biology
- Communications in Algebra
- Communications in Statistics – Theory and Methods
- Computer Aided Geometric Design
- Discrete Mathematics, Algorithms and Applications
- Electronic Journal of Combinatorics
- European Journal of Combinatorics
- Foundations of Computational Mathematics
- IEEE/ACM Transactions on Computational Biology and Bioinformatics
- Journal of Algebra
- Journal of Algebra and Its Applications
- Journal of Algebraic Statistics
- Journal of Commutative Algebra
- Journal of Machine Learning Research
- Journal of Symbolic Computation
- La Matematica
- Selecta Mathematica
- SIAM Journal of Discrete Mathematics
- SIAM Journal on Matrix Analysis and Applications
- The Scientific World Journal

Conferences refereed

- 2022 International Symposium on Symbolic and Algebraic Computation (ISSAC)
- Special issue on Nonlinear Computational Geometry of the IMA Volumes in Mathematics and its Applications, Springer–Verlag
- Algebraic Biology 2007 Conference Proceedings
- 2009 Effective Methods in Algebraic Geometry (MEGA) Conference

Granting agencies refereed

- Division Physical Sciences of Netherlands Organisation for Scientific Research
- National Security Agency (NSA) Mathematical Sciences Grant Program
- National Science Foundation (NSF) Research Experiences for Undergraduates Program
- National Science Foundation (NSF) International Research Fellowship Program
- National Science Foundation (NSF) Division of Mathematical Sciences
- México's Consejo Nacional de Ciencia y Tecnología (Conacyt)

Conference, Meeting and Seminar Organization

- | | |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2025 | 2025 International Symposium on Symbolic and Algebraic Computation (ISSAC) in Guanajuato, Mexico. Program Committee Member. |
| 2024 | 2024 Workshop on Computational and Applied Enumerative Geometry at The Fields Institute for Research in Mathematical Sciences in Toronto, Canada. Organizing Committee Member (with Taylor Brysiewicz, Nickolas Hein, Jordy Lopez Garcia, Kevin Purbhoo). |
| 2024 | Spring 2024 Rocky Mountain Section Meeting of the Mathematical Association of America. Local Organizing Committee Member (with Molly Moran). |
| 2018 – 2020 | CombinaTexas Annual Conference Scientific Committee Member. |
| 2017 | (with Alicia Dickenstein and Carina Curto). Special session on Applied and Computational Algebra and Geometry. Mathematical Congress of the Americas 2017, Montréal, Canada. |
| 2016 | Mathematics and Statistics Colloquium, Sam Houston State University, Huntsville, TX.

(with Alicia Dickenstein and Carina Curto). Thematic session on Computational Algebra and Applications of Algebra. XXI Coloquio Latinoamericano de Álgebra, Buenos Aires, Argentina.

(with Daniela Ferrero, Laura Matusevich, Ken Smith, and Catherine Yan). CombinaTexas 2016 Conference, Texas A&M University, College Station, TX. |
| 2015 | Mathematics and Statistics Colloquium, Sam Houston State University, Huntsville, TX.

(with Dino Lorenzini, Criel Merino, David Perkinson, and Carlos Valencia). Workshop on Sandpile Groups. Banff International Research Station (BIRS) Affiliate Casa Matemática Oaxaca (CMO), Oaxaca, México.

(with Martha Paola Vera-Licona, Jason Cory Brunson, Elena Dimitrova, and Brandilyn Stigler). 2015 Conference on Algebraic and Combinatorial Approaches in Systems Biology, University of Connecticut Health Center, Farmington, CT. |
| 2014 | Mathematics and Statistics Colloquium, Sam Houston State University, Huntsville, TX. |

- (with Laura Matusevich, Jacob White, and Catherine Yan). CombinaTexas 2014 Conference, Texas A&M University, College Station, TX.
- 2013 (with Damon Hay and Ed Swim). Mathematics and Statistics Colloquium, Sam Houston State University, Huntsville, TX.
- (with Sergi Elizalde, Daniela Ferrero, and Carlos Valencia). Special session on Applied Combinatorics. Mathematical Congress of the Americas 2013, Guanajuato, México.
- (with Frank Sottile). Minisymposium on Approximation Theory, Geometric Modeling, and Algebraic Geometry. 2013 SIAM Conference on Applied Algebraic Geometry, Colorado State University, Fort Collins, CO.
- 2012 Mathematics and Statistics Colloquium, Sam Houston State University, Huntsville, TX.
- (with Daniela Ferrero, Martin Malandro, Alison Marr, Lucas Rusnak, and Catherine Yan). CombinaTexas 2012 Conference, Southwestern University, Georgetown, TX.
- 2011 (with Daniela Ferrero, Martin Malandro and Ken Smith). CombinaTexas 2011 Conference, Sam Houston State University, Huntsville, TX.
- (with Ken Smith). Working Algebra Seminar, Sam Houston State U., Huntsville, TX.
- (with Tatyana Sorokina). Minisymposium on Interactions Among Algebraic Geometry, Geometric Modeling, and Approximation Theory. SIAM Conference on Applied Algebraic Geometry, North Carolina State University, Raleigh, NC.
- (with Rebecca Garcia). Scientific Symposia Session on Mathematical Models: Current Research Of Present-Day Role Models Of The Underrepresented. SACNAS 2011 National Conference, San Jose Convention Center, San Jose, CA.
- 2010 (with Frank Sottile). AMS–SIAM special session on Applications of Algebraic Geometry. 2010 Joint Mathematics Meetings, San Francisco, CA.
- (with Scott Chapman, Rebecca Garcia, Martin Malandro and Ken Smith). Algebra and Combinatorics Seminar, Sam Houston State University, Huntsville, TX.
- 2009 (with Frank Sottile). AMS special session on Applicable Algebraic Geometry. 2009 Fall Central Section Meeting of the AMS, Baylor University, Waco, TX.
- (with Tatyana Sorokina). Second International Workshop on Algebraic Geometry and Approximation Theory, Towson University, Towson, MD.
- (with Scott Chapman, Rebecca Garcia, Martin Malandro and Ken Smith) Algebra and Combinatorics Seminar, Sam Houston State University, Huntsville, TX.
- 2008 (with Tatyana Sorokina). First International Workshop on Algebraic Geometry and Approximation Theory, Towson University, Towson, MD.
- (with Scott Chapman, Rebecca Garcia, Martin Malandro and Ken Smith). Algebra and Combinatorics Seminar, Sam Houston State University, Huntsville, TX.
- 2007 (with Frank Sottile). Algebra and Combinatorics Seminar, Texas A&M University, College Station, TX.
- 2006 (with Frank Sottile). Algebra and Combinatorics Seminar, Texas A&M University, College Station, TX.

- 2003 (with Reinhard Laubenbacher). Algebraic Statistics Seminar, Virginia Tech., Blacksburg, VA.
- 2002 (with Lorenzo Robbiano). Algebraic Geometry of Graphical Models Seminar, University of Genova, Italy.
- Founder of the SIAM Graduate Student Seminar, Virginia Tech., Blacksburg, VA.
- 2001 (with Reinhard Laubenbacher). Gröbner Bases and Convex Polytopes Seminar, New Mexico State University, Las Cruces, NM.

General Public Talks

Tiger Talks

Diversity, Equity and Inclusion in Mathematics

Colorado College
Colorado Springs, CO
October 2021

Plenary Talks

Colorado Conference for Underrepresented Students in Mathematics 2023 Colorado State Univ.
An Introduction to Algebraic Statistics Fort Collins, CO
April 2023

Latinx in the Mathematical Sciences Conference 2022 Institute for Pure & Applied Mathematics
Arithmetical structures Los Angeles, CA
July 2022

2019 Mathematical Sciences Research Institute – Undergraduate Program MSRI
Self-organized criticality, power laws, and parking functions Berkeley, CA
July 2019

2018 Blackwell-Tapia Conference ICERM
Counting arithmetical structures Providence, RI
November 2018

Modern Math Workshop 2015 SACNAS The National Diversity in STEM Conference
An Introduction to the Theory of Sandpiles Washington, DC
Minicourse October 2015

Algebraic Statistics 2015 University of Genova
Tutorial on Algstat: an R package for algebraic statistics Genova, Italy
June 2015

Algebraic Statistics 2014 Illinois Institute of Technology
Noncommutative Fourier analysis of partially ranked data Chicago, IL
May 2014

Conference Talks

Computations and Data in Algebraic Statistics Workshop <i>Identifiability of Structural Equation Models</i>	BIRS Casa Matemática Oaxaca Oaxaca, Mexico May 2023
Combinatorial, Computational, and Applied Algebraic Geometry 2022 <i>Algebraic degrees of phylogenetic varieties (poster)</i>	University of Washington Seattle, WA June 2022
Southwest Local Algebra Meeting <i>Counting arithmetical structures</i>	Tulane University New Orleans, LA March 2020
Comp. Algebra and Applications of Algebra <i>Absolute concentration robustness</i>	XXIII Coloquio Latinoamericano de Álgebra México City, México August 2019
Computational Algebraic Geometry Session International Congress on Mathematical Software (ICMS 2018) <i>Neural ideals in SageMath</i>	University of Notre Dame Denton, TX July 2018
Applicable and Computational Algebraic Geometry 2017 AMS Fall Central Sectional Meeting <i>Gröbner bases of neural ideals</i>	University of North Texas Denton, TX September 2017
Geo. Combinatorics and Combinatorial Commutative Alg. 2017 AMS Fall Central Sectional Meeting <i>Counting arithmetical structures</i>	University of North Texas Denton, TX September 2017
Sesión de Combinatoria algebraica <i>Counting arithmetical structures</i>	XXII Coloquio Latinoamericano de Álgebra Quito, Ecuador August 2017
Sesión de Álgebra Computacional y Aplicaciones del Álgebra <i>Gröbner bases of neural ideals</i>	XXII CLA Quito, Ecuador August 2017
Session on Applied and Computational Algebra and Geometry Mathematical Congress of the Americas 2017 <i>Gröbner bases of neural ideals</i>	McGill University Montréal, Canada July 2017
Workshop on Graph Theory and Combinatorics Foundations of Computational Mathematics 2017 <i>Counting arithmetical structures (poster)</i>	Universitat de Barcelona Barcelona, Spain July 2017
Workshop on Algebraic Statistics Mathematisches Forschungsinstitut Oberwolfach <i>AlgStat: Computational Algebraic Statistics</i>	Oberwolfach, Germany April 2017
Chip-Firing and Divisors on Graphs and Complexes 2016 AMS Fall Central Sectional Meeting <i>Accessibility numbers in abelian sandpile model on a directed graph</i>	University of St. Thomas Minneapolis, MN October 2016
Abstract Algebra Research Topics for Undergraduates <i>Sandpile groups for undergraduates</i>	SACNAS National Conference Long Beach, CA October 2016
Algebraic and Combinatorial Methods in Mathematical Biology 2016 AMS Spring Southeastern Sectional Meeting <i>Algebraic Statistics Applications in Epidemiology</i>	University of Georgia Athens, GA March 2016

Workshop on Multivariate Splines and Algebraic Geometry	
Mathematisches Forschungsinstitut Oberwolfach	Oberwolfach, Germany
<i>Multivariate toric Bézier patches</i>	April 2015
AMS Special Session on Parameters in Graph Theory	
2015 Joint Mathematics Meetings	San Antonio, TX
<i>Accessibility numbers in the sandpile monoid of a directed graph</i>	January 2015
Sesión de Combinatoria algebraica	XX Coloquio Latinoamericano de Álgebra
<i>Accessibility numbers in the sandpile monoid of a graph</i>	Lima, Perú
	December 2014
Workshop on algebraic statistics	Institute of Information Theory and Automation
Prague Stochastics 2014	Prague, Czech Republic
<i>Algebraic Statistics in R: Markov Bases</i>	August 2014
Contributed Session	
CombinaTexas 2014	Texas A&M University
<i>Identifiability of structural equation models</i>	College Station, TX
	April 2014
Special Session on Applied Combinatorics	CIMAT
Mathematical Congress of the Americas 2013	Guanajuato, Mexico
<i>Algebraic and combinatorial structure of sandpile monoids on digraphs</i>	August 2013
Minisymposium Identifiability Problems in Biology and Stats.	Colorado State Univ.
SIAM Conference on Applied Algebraic Geometry	Fort Collins, CO
<i>Identifiability of structural equation models on 6 random variables</i>	August 2013
Minisymposium Approx. Theory, Geom. Modeling, and Alg. Geo.	Colorado State U.
SIAM Conference on Applied Algebraic Geometry	Fort Collins, CO
<i>Toric degenerations of (irrational) Bézier patches</i>	August 2013
Session on Algebraic Statistics	University of Louisville
Southern Regional Council on Statistics Research Conference	Burns, TN
<i>Graphical causal models: An algebraic perspective</i>	June 2013
Algebraic Geometry and Geometric Modeling Workshop	Banff IRS
<i>The control polyhedron of a rational Bézier surface</i>	Vancouver, Canada
	January 2013
CombinaTexas 2012	Southwestern University
<i>Ideals of graph homomorphisms</i>	Georgetown, TX
	April 2012
MAA Invited Paper Session on Algebraic Statistics	
2012 Joint Mathematics Meetings	Boston, MA
<i>What is an Algebraic Statistical Model?</i>	January 2012
Minisymposium on Graphical Statistical Models	North Carolina State University
First SIAM Conference on Applied Algebraic Geometry	Raleigh, NC
<i>Parameter identification of structural equation models</i>	October 2011
Kickoff Workshop on Algebraic Geometry in the Sciences	CMA, University of Oslo
<i>Toric degenerations of Bézier patches</i>	Oslo, Norway
	January 2011
⁹ th International Workshop ACCOTA	Playa del Carmen, Quintana Roo, México
<i>Ideals of graph homomorphisms</i>	November 2010
² nd Southeast Texas Workshop on Discrete Math	Sam Houston State University
<i>What is algebraic statistics?</i>	Huntsville, TX
	October 2010

Parameter Identification in Graphical Models Workshop <i>Identifying causal effects with computer algebra</i>	American Inst. of Mathematics Palo Alto, CA October 2010
Macaulay2 Workshop at Colorado College <i>Algebraic statistics library for Macaulay2</i>	Colorado Springs, CO August 2010
Special Session on Advances in Algebraic Statistics AMS 2010 Spring Southeastern Sectional Meeting <i>Identifiability of graphical models</i>	University of Kentucky Lexington, KY March 2010
Special Session on Applications of Math Software to Math Research International Conference on Applications of Computer Algebra <i>Experimentation at the frontiers of reality in Schubert calculus</i>	ÉTS Montréal, Canada June 2009
Transition Workshop Algebraic Methods in Systems Biology and Statistics <i>Applications of toric varieties in the sciences</i>	SAMSI Research Triangle Park, NC June 2009
2nd International Workshop on Alg. Geometry and Approx. Theory <i>Geometric properties of toric patches</i>	Towson University Towson, MD April 2009
Special Session on Mathematics of Biochemical Reaction Networks 2009 Spring AMS Southeastern Section Meeting <i>Injectivity of toric patches</i>	NCSU Raleigh, NC April 2009
SAMSI Two-Day Undergraduate Workshop 2008-09 SAMSI Education and Outreach Program <i>Introductory lecture on algebraic statistical models</i>	SAMSI Research Triangle Park, NC February 2009
Special Session on Computational Algebra and Convexity 2009 Joint Mathematics Meetings <i>Geometrical aspects of control points for toric patches</i>	Washington, D.C. January 2009
Workshop on Algebraic Statistical Models Algebraic Methods in Systems Biology and Statistics <i>Algebraic methods for phylogenetic inference (poster)</i>	SAMSI Research Triangle Park, NC January 2009
8th International Workshop ACCOTA <i>Sandpile models</i>	Oaxaca City, Oaxaca, México December 2008
8th International Workshop ACCOTA <i>Algebra, geometry and combinatorics of sandpiles (poster)</i>	Oaxaca City, Oaxaca, México December 2008
Fourth Annual Texas Undergraduate Mathematics Conference <i>How to draw complex functions</i>	SHSU Huntsville, TX September 2008
Workshop on Geometry and Representation Theory of Tensors <i>Phylogenetic algebraic geometry</i>	MSRI Berkeley, CA July 2008
1st International Workshop on Alg. Geometry and Approx. Theory <i>Linear precision for toric patches</i>	Towson University Towson, MD April 2008
1st International Workshop on Alg. Geometry and Approx. Theory <i>What is computational algebraic geometry?</i>	Towson University Towson, MD April 2008

Special session on Toric Varieties	University of Central Florida
32nd SIAM Southeastern-Atlantic Section Conference	Orlando, FL
<i>Linear precision for toric patches</i>	March 2008
Second Workshop on Constructive Function Theory	Sam Houston State University
<i>Linear precision for toric patches</i>	Huntsville, TX
	October 2007
IMA PI Summer Program in Applicable Algebraic Geometry	Texas A&M University
<i>Bézier curves and surfaces</i>	College Station, TX
	July 2007
Workshop on Non-Linear Computational Geometry Applications	IMA
<i>Linear precision for parametric patches (poster)</i>	Minneapolis, MN
	May 2007
Special Session on Computational Algebraic and Analytic Geometry	
2007 Joint Mathematics Meetings	New Orleans, LA
<i>Linear precision for parametric patches</i>	January 2007
Special Session on Algebraic Geometry	
Sixth Joint AMS–SMM International Meeting	Houston, TX
<i>Algebraic geometry applications in Bayesian model selection</i>	May 2004
Workshop on Algorithmic, Combinatorial and Applicable Real Alg. Geo.	MSRI
Topological Aspects of Real Algebraic Geometry	Berkeley, CA
<i>Algebraic geometry applications in model selection</i>	April 2004
Computational Algebraic Statistics	American Institute of Mathematics
<i>Independence varieties of Bayesian networks</i>	Palo Alto, CA
	December 2003
Closing Workshop	SAMSI
Challenges in Stochastic Computation	Research Triangle Park, NC
<i>Algebraic geometry of Bayesian networks with hidden variables</i>	June 2003
Effective Methods in Algebraic Geometry Conference	Kaiserslautern, Germany
<i>Algebraic geometry of Bayesian networks</i>	June 2003
International School on Algebraic Statistics	Université Nice Sophia Antipolis
Grostat VI Conference	Nice, France
<i>Algebraic classification of Bayesian networks</i>	February 2003
Special Session on Systems	
2002 SIAM Discrete Mathematics Conference	San Diego, CA
<i>Classification of finite dynamical systems</i>	August 2002
Graduate Oral Presentations in Mathematics	
SACNAS National Conference	Phoenix, AZ
<i>Mathematical foundations for computer simulations</i>	September 2001
Graduate Oral Presentations in Mathematics	
SACNAS National Conference	Atlanta, GA
<i>Combinatorial tools for the analysis of decision systems</i>	October 2000
Computational Algebra with Applications Conference	University of Wyoming
<i>Computing Gröbner bases associated to finite modules</i>	Laramie, WY
	June 1999
Computational Algebra with Applications Conference	University of Wyoming
<i>Computing syzygies à la Gauß-Jordan</i>	Laramie, WY
	June 1999

Colloquium and Seminar Talks

University of Michigan-Dearborn Mathematics REU Seminar <i>What is an Arithmetical Structure?</i>	Online June 2024
Colorado College Mathematics & Computer Science Seminar <i>Using Exact Tests from Algebraic Statistics in Contingency Table Analyses</i>	Colorado Springs, CO May 2024
University of Colorado Boulder & Kempner Mathematics Colloquium <i>What is an Arithmetical Structure?</i>	Boulder, CO May 2024
Colorado College Mathematics & Computer Science Seminar <i>Arithmetical Structures</i>	Colorado Springs, CO September 2023
Pomona College Mathematics Colloquium <i>An Introduction to Algebraic Statistics</i>	Claremont, CA September 2022
Pomona College Algebra/Number Theory/Combinatorics Seminar <i>Arithmetical Structures</i>	Claremont, CA September 2022
University of Wisconsin-Milwaukee Mathematics Colloquium <i>An Introduction to Algebraic Statistics</i>	Milwaukee, WI September 2022
Trinity University Mathematics Seminar <i>An Introduction to Nonlinear Algebra</i>	San Antonio, TX March 2022
Lathisms: Café con Leche <i>Sandpile Monoids</i>	Lathisms: Latinxs and Hispanics in the Mathematical Sciences October 2021
Colorado College Mathematics & Computer Science Seminar <i>Estimating Gaussian Mixtures</i>	Colorado Springs, CO October 2021
Colorado College Mathematics & Computer Science Seminar <i>An Introduction to Algebraic Statistics</i>	Colorado Springs, CO February 2021
Sam Houston State University ProfSPEAK 2017-2018 speaker series <i>Modern Algebra Techniques in Theoretical Neuroscience</i>	Huntsville, TX February 2018
Sam Houston State University Teaching Seminar <i>Creating a Sustainable Undergraduate Research Program</i>	Huntsville, TX September 2017
The University of Texas at Tyler Mathematics REU Colloquium <i>What is a sandpile group?</i>	Tyler, TX June 2017
SHSU Department of Mathematics and Statistics Colloquium <i>Modern mathematics in cancer studies: The need for small data analysis</i>	Huntsville, TX May 2017
Northern Arizona University Special Interdisciplinary Colloquium <i>Modern mathematics in cancer studies: The need for small data analysis</i>	Flagstaff, AZ April 2017
Northern Arizona University Mathematics Colloquium <i>Modern Algebra Techniques in theoretical neuroscience studies</i>	Flagstaff, AZ April 2017
Northern Arizona University Honors Day Lecture <i>What is a sandpile group?</i>	Flagstaff, AZ April 2017

University of Kentucky Math Club Seminar <i>Euclidean Steiner Tree Problem</i>	Lexington, KY March 2017
University of Kentucky Discrete CATS Seminar <i>What is a sandpile group?</i>	Lexington, KY March 2017
University of Kentucky Applied Mathematics Seminar <i>Algebraic Statistics Applications in Epidemiology</i>	Lexington, KY March 2017
Texas A&M University Algebra and Combinatorics Seminar <i>Counting Arithmetical Structures</i>	College Station, TX February 2017
University of Houston Mathematics Colloquium <i>Toric degenerations of Bézier patches</i>	Houston, TX April 2016
Sam Houston State University Teaching Seminar <i>The Active Classroom</i>	Huntsville, TX March 2016
Southern Methodist University Statistical Science Seminar <i>Identifiability of structural equation models</i>	Dallas, TX November 2014
Reed College Mathematics Colloquium <i>Noncommutative Fourier analysis of partially ranked data</i>	Portland, OR April 2014
Cinvestav Mathematics Colloquium <i>Algebraic Geometry of Linear Structural Equation Models</i>	Cinvestav, Mexico City, México August 2013
Texas A&M Algebra and Combinatorics Seminar <i>Algebraic and combinatorial structure of sandpile monoids on directed graphs</i>	College Station, TX April 2013
Sam Houston State University Mathematics Colloquium <i>Sandpile groups of book graphs</i>	Huntsville, TX November 2012
Texas Tech University Mathematics Colloquium <i>The control polyhedron of a rational Bézier surface</i>	Lubbock, TX November 2012
Dartmouth College Mathematics Colloquium <i>The control polyhedron of a rational Bézier surface</i>	Hanover, NH September 2012
Pacific Undergraduate Research Experience Colloquium <i>Sandpile groups of book graphs</i>	Hilo, HI July 2012
Sam Houston State University Friday Afternoon Club <i>Algebraic Statistics: Recent advances and future progress</i>	Huntsville, TX December 2011
Texas State University Discrete Mathematics Seminar <i>The control polyhedron of a rational Bézier surface</i>	San Marcos, TX December 2011
Georgia Institute of Technology Algebra Seminar <i>The control polyhedron of a rational Bézier surface</i>	Atlanta, GA November 2011
Sam Houston State University Friday Afternoon Club <i>Teaching Algebraic Structures using the ABC</i>	Huntsville, TX September 2011
Duke University Algebraic Geometry Seminar <i>Toric degenerations of Bézier patches</i>	Durham, NC April 2011
Sam Houston State University Mathematics Colloquium <i>Toric degenerations of Bézier patches</i>	Huntsville, TX March 2011
Sam Houston State University Friday Afternoon Club <i>How to draw complex functions</i>	Huntsville, TX January 2011
Sam Houston State University Friday Afternoon Club <i>What is Schubert calculus?</i>	Huntsville, TX November 2010

University of Dallas Mathematics Colloquium <i>How to draw complex functions</i>	Dallas, TX April 2010
Southern Methodist University Research Colloquium <i>What is algebraic statistics ... good for?</i>	Dallas, TX November 2009
Coloquio del Instituto de Matemáticas <i>The Geometry of Toric Patches</i>	UNAM, Mexico City, México April 2009
Cinvestav Mathematics Colloquium <i>The Geometry of Toric Patches</i>	Cinvestav, Mexico City, México April 2009
North Carolina State University Symbolic Computation Seminar <i>The Geometry of Toric Patches</i>	Raleigh, NC March 2009
Clemson University Algebra and Discrete Mathematics Seminar <i>The Geometry of Toric Patches</i>	Clemson, SC March 2009
SAMSI Algebraic Statistics and Experimental Design Seminar <i>Linear Precision of toric patches is ML degree 1 of toric statistical models</i>	Res. Triangle Park, NC February 2009
Reed College Mathematics Colloquium <i>The Geometry of Toric Patches</i>	Portland, OR February 2009
Sam Houston State University Mathematics Colloquium <i>What is algebraic statistics ... good for?</i>	Huntsville, TX November 2008
Sam Houston State University Mathematics Colloquium <i>Phylogenetic Algebraic Geometry</i>	Huntsville, TX August 2007
Texas A&M University Algebra and Combinatorics Seminar <i>Linear precision for multi-sided toric patches</i>	College Station, TX March 2007
North Carolina State University Mathematics Colloquium <i>What is algebraic statistics?</i>	Raleigh, NC January 2007
Sam Houston State University Mathematics Colloquium <i>Linear precision for multi-sided toric patches</i>	Huntsville, TX January 2007
Sam Houston State University Mathematics Colloquium <i>What is algebraic statistics?</i>	Huntsville, TX November 2006
Texas A&M University Algebra and Combinatorics Seminar <i>Finite Abelian p-groups and toric ideals</i>	College Station, TX May 2006
Texas A&M University Postdoc Seminar <i>What is algebraic statistics?</i>	College Station, TX October 2005
UC Berkeley Algebraic Statistics for Computational Biology Seminar <i>Catalog of small trees</i>	Berkeley, CA March 2005
MSRI Postdoc Seminar <i>Minimal Cohen–Macaulay deformations of matroid ideals</i>	MSRI, Berkeley, CA December 2004
Texas A&M University Algebraic Geometry Seminar <i>Solving the likelihood equations of small phylogenetic trees</i>	College Station, TX November 2004
Sam Houston State University Mathematics Colloquium <i>Tropical Mathematics</i>	Huntsville, TX October 2004
University of Washington Algebra Seminar <i>Algebraic geometry of Bayesian networks</i>	Seattle, WA April 2004
Georgia Tech Informal Geometry Seminar <i>Algebraic geometry of Bayesian networks</i>	Atlanta, GA August 2003

Instituto de Matemáticas Unidad Morelia Algebra Seminar <i>Algebraic geometry of Bayesian networks</i>	UNAM, Morelia, México May 2003
UC Berkeley Workshop on Algebraic Statistics <i>Algebraic geometry of Bayesian networks</i>	Berkeley, CA January 2003
University of Cantabria Algebra Seminar <i>Algebraic geometry of Bayesian networks</i>	Santander, Spain December 2002
University of Cantabria Combinatorics Seminar <i>Resolutions of Cohen-Macaulay deformations of matroid ideals</i>	Santander, Spain December 2002
Politecnico di Torino Algebraic Statistics Seminar <i>Algebraic geometry of Bayesian networks</i>	Torino, Italy November 2002
MSRI Combinatorial Commutative Algebra Seminar <i>Resolutions of matroid ideals</i>	MSRI, Berkeley, CA August 2002
Virginia Tech SIAM Graduate Student Seminar <i>Resolutions of matroid ideals</i>	Blacksburg, VA March 2002
Virginia Tech SIAM Graduate Student Seminar <i>Combinatorics of the primary decomposition of Cohen-Macaulay monomial ideals</i>	Blacksburg, VA March 2002
University of Bordeaux I Seminar <i>Mathematical foundations for computer simulations</i>	Bordeaux, France October 2001

Professional Associations

American Mathematical Society (AMS)
 Mathematical Association of America (MAA)
 National Alliance for Doctoral Studies in the Mathematical Sciences
 Society for Industrial and Applied Mathematics (SIAM)
 Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
 Sociedad Matemática Mexicana (SMM)

Programming Skills

Languages: C, C++, Perl, Python, R
Operating Systems: Linux, UNIX, Mac OS X
Computer Algebra Systems: CoCoA, Macaulay2, Maple, Mathematica, Matlab, SageMath, Singular
Web Development: MySQL, PHP, HTML, CSS

Software

- Algstat-DIF: An R package for DIF analysis using algebraic statistics tools (joint work with Shishir Agrawal, Minh Kim, and Flavia Sancier-Barbosa). <https://github.com/sagrawalx/algstat-dif>
- GraphicalModelsMLE.m2: A Macaulay2 package to compute maximum likelihood estimates for Gaussian graphical models. Package included in the standard Macaulay2 distribution (joint work with Carlos Améndola, Roser Homs, Olga Kuznetsova, and Harshit Motwani). Macaulay2 is a computer algebra system developed by Michael Stillman and Daniel Grayson. <http://www.math.uiuc.edu/Macaulay2/Packages/>
- NeuralIdeals: A SageMath package to perform computations with neural ideals associated to neural codes (joint work with Ethan Petersen, Nora Youngs, Ryan Kruse, Dane Miyata, and Rebecca Garcia). <https://github.com/e6-1/NeuralIdeals>
- Algstat: An R package for algebraic statistics (joint work with David Kahle and Ruriko Yoshida). Package included in the The Comprehensive R Archive Network (cran). <https://github.com/dkahle/algstat>
- GraphicalModels.m2: A Macaulay2 package for algebraic statistics. Package included in the standard Macaulay2 distribution (joint work with Mike Stillman, Sonja Petrovic and Seth Sullivan). Macaulay2 is a computer algebra system developed by Michael Stillman and Daniel Grayson. <http://www.math.uiuc.edu/Macaulay2/Packages/>
- Designer and principal developer of the Identifiability of Structural Equation Models website (with Sarah Spielvogel and Seth Sullivan). This website contains software and data related to the parameter identifiability problem for Gaussian graphical models. <https://www.coloradocollege.edu/aapps/ldg/>
- Collaborator in the *Polynome: Discrete System Identification* project. Polynome is a web-based software for the reconstruction and parameter estimation of algebraic models in systems biology, now subsumed into ADAM: Analysis of Dynamic Algebraic Models. <http://adam.plantsimlab.org>
- Collaborator in the *Frontiers of reality in Schubert calculus* project. We develop software to execute a large-scale computation to study questions in the Schubert calculus, with a focus on generalizations of the Shapiro conjecture. <http://www.math.tamu.edu/~secant/>
- Designer and principal developer of the Small Phylogenetic Trees website: This website contains algebraic information of small phylogenetic trees under several models of biological evolution. Maple package to perform all computations is included (with J. Porter). <https://www.coloradocollege.edu/aapps/ldg/small-trees/>
- Singular library to compute all complex solutions to the critical equations of the maximum likelihood function of a statistical model. Singular is a computer algebra system developed at the University of Kaiserslautern.
- CoCoA library to compute the primary decomposition of zero dimensional ideals. CoCoA is a computer algebra system developed at the University of Genova, Italy.
- C++ program to compute combinatorial homotopy of simplicial complexes (with R. Laubenbacher).