Luis David García Puente

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

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Professional Preparation

Universidad Nacional Autónoma de México (UNAM) — Mexico City, México
B.S. Mathematics (with Honors) — *1999*

Virginia Polytechnic Institute and State University — Blacksburg, VA
Ph.D. Mathematics — *2004*

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

University of California, Berkeley — Berkeley, CA
Postdoctoral Fellow — *Summer 2004*

- Mentor: Lior Pachter

Mathematical Sciences Research Institute (MSRI) — Berkeley, CA
Postdoctoral Fellow — *Fall 2004*

- Mentor: Bernd Sturmfels

Texas A&M University — College Station, TX
Visiting Assistant Professor — *2005 – 2007*

- Mentor: Frank Sottile

Appointments

Colorado College — Colorado Springs, CO
Professor of Mathematics and Computer Science — *2021 –*

Sam Houston State University — Huntsville, TX
Professor of Mathematics — *2019 – 2021*

Sam Houston State University — Huntsville, TX
Associate Department Chair — *Fall 2017 – 2021*

Sam Houston State University — Huntsville, TX
Associate Professor of Mathematics — *2013 – 2019*

Statistical and Applied Mathematical Sciences Institute — Research Triangle Park, NC
SAMSI New Researcher fellowship — *Spring 2009*

Sam Houston State University — Huntsville, TX
Assistant Professor of Mathematics — *2007 – 2013*

Virginia Bioinformatics Institute (Virginia Tech) — Blacksburg, VA
Graduate Research Assistant — *Spring 2004*

Virginia Polytechnic Institute and State University — Blacksburg, VA
Graduate Teaching Assistant — *2002 – 2003*

University of Genova Genova, Italy
Research Fellow *Fall 2002*

- Mentor: Lorenzo Robbiano

Physical Science Laboratory (New Mexico State University) Las Cruces, NM
Graduate Research Fellow *Summer 2000*

New Mexico State University Las Cruces, NM
Graduate Teaching Assistant *1999-2001*

Universidad Nacional Autónoma de México (UNAM) Mexico City, Mexico
Ayudante de Profesor tipo A (Teaching Assistant) *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 Notices of the AMS
Featured Mathematician in honor of the Hispanic Heritage Month *October 2016*

Sistema Nacional de Investigadores Consejo Nacional de Ciencia y Tecnología, México
Investigador Nacional Nivel I *2015 – 2017*

Sociedad Matemática Mexicana México
Sotero Prieto Award *1999*

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

Grants

Colorado College 2022 Summer Student Collaborative Research (SCoRe) Grant $\$8,000.00$

- PI in the proposal "Exploring small Ramsey numbers".

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 Undergradautes $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. Luis David García Puente, Elizabeth Gross, Heather A. Harrington, Matthew Johnston, Nicolette Meshkat, and Anne Shiu. Absolute concentration robustness: algebra and geometry. In progress.
2. Luis David García Puente, Marina Garrote-López, Elima Shehu. Computing algebraic degrees of phylogenetic varieties. Submitted to Algebraic Statistics. https://arxiv.org/abs/2210.02116
3. Carlos Améndola, Luis David García Puente, Roser Homs, Olga Kuznetsova, Harshit Motwani. Computing maximum likelihood estimates for Gaussian graphical models with Macaulay2. Accepted. https://arxiv.org/abs/2012.11572v1
4. 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
5. 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
6. 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
7. 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
8. 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
9. 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
10. 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
11. 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

12. 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

13. 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

14. 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

15. 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

16. 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

17. 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

18. 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

19. Luis D. García-Puente, Sarah Spielvogel, and Seth Sullivant. Identifying causal effects with computer algebra. P. Grünwald and P. Spirtes (Editors). *Proceedings of the* 26^{th} *Conference of Uncertainty in Artificial Intelligence (UAI 2010)*. AUAI Press (2010).
https://event.cwi.nl/uai2010/papers/UAI2010_0087.pdf

20. 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

21. 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

22. Maria A. Aviño-Diaz, 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

23. 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

24. 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

25. 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

26. Luis David Garcia. Algebraic Statistics in model selection. M. Chickering and J. Halpern, editors, *Proceedings of the* 20^{th} *Conference of Uncertainty in Artificial Intelligence*, (2004) 177–184. https://dl.acm.org/doi/10.5555/1036843.1036865

27. 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

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

Fall 2022	Casmali Lopez (Undergraduate Thesis), Timothy Somerset (Independent studies)
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 Agrinsoni 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

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 trough 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

Sum. 2016 Ashley K. Wheeler (University of Arkansas). Post-doctoral mentor supported trough the Mathematical Sciences Research Institute - Undergraduate Program (MSRI-UP 2016).

Early Career Faculty

2022- 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 Curriculum Executive Committee	2022–
Colorado College Mentoring Alliance Program Convener	2022–
Colorado College Antiracism Commitment Committee	2021–
Colorado College Mentoring Alliance Program member	2021–
Colorado College Departmental Outreach Committee	2021–2023
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

Editorial, Referee and Review Activities

Editorial Activities

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

Reviewer Activities

- 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
- 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

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 — Colorado College
Diversity, Equity and Inclusion in Mathematics — Colorado Springs, CO
October 2021

Plenary Talks

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

Combinatorial, Computational, and Applied Algebraic Geometry 2022 — University of Washington
Algebraic degrees of phylogenetic varieties (poster) — Seattle, WA
June 2022

Southwest Local Algebra Meeting — Tulane University
Counting arithmetical structures — New Orleans, LA
March 2020

Comp. Algebra and Applications of Algebra — XXIII Coloquio Latinoamericano de Álgebra
Absolute concentration robustness — México City, México
August 2019

Computational Algebraic Geometry Session — University of Notre Dame
International Congress on Mathematical Software (ICMS 2018) — Denton, TX
Neural ideals in SageMath — *July 2018*

Applicable and Computational Algebraic Geometry — University of North Texas
2017 AMS Fall Central Sectional Meeting — Denton, TX
Gröbner bases of neural ideals — *September 2017*

Geo. Combinatorics and Combinatorial Commutative Alg. — University of North Texas
2017 AMS Fall Central Sectional Meeting — Denton, TX
Counting arithmetical structures — *September 2017*

Sesión de Combinatoria algebraica — XXII Coloquio Latinoamericano de Álgebra
Counting arithmetical structures — Quito, Ecuador
August 2017

Sesión de Álgebra Computacional y Aplicaciones del Álgebra — XXII CLA
Gröbner bases of neural ideals — Quito, Ecuador
August 2017

Session on Applied and Computational Algebra and Geometry — McGill University
Mathematical Congress of the Americas 2017 — Montréal, Canada
Gröbner bases of neural ideals — *July 2017*

Workshop on Graph Theory and Combinatorics — Universitat de Barcelona
Foundations of Computational Mathematics 2017 — Barcelona, Spain
Counting arithmetical structures (poster) — *July 2017*

Workshop on Algebraic Statistics
Mathematisches Forschungsinstitut Oberwolfach — Oberwolfach, Germany
AlgStat: Computational Algebraic Statistics — *April 2017*

Chip-Firing and Divisors on Graphs and Complexes — University of St. Thomas
2016 AMS Fall Central Sectional Meeting — Minneapolis, MN
Accessibility numbers in abelian sandpile model on a directed graph — *October 2016*

Abstract Algebra Research Topics for Undergraduates — SACNAS National Conference
Sandpile groups for undergraduates — Long Beach, CA
October 2016

Algebraic and Combinatorial Methods in Mathematical Biology — University of Georgia
2016 AMS Spring Southeastern Sectional Meeting — Athens, GA
Algebraic Statistics Applications in Epidemiology — *March 2016*

Workshop on Multivariate Splines and Algebraic Geometry
Mathematisches Forschungsinstitut Oberwolfach — Oberwolfach, Germany
Multivariate toric Bézier patches — *April 2015*

AMS Special Session on Parameters in Graph Theory
2015 Joint Mathematics Meetings — San Antonio, TX
Accessibility numbers in the sandpile monoid of a directed graph — *January 2015*

Sesión de Combinatoria algebraica — XX Coloquio Latinoamericano de Álgebra
Accessibility numbers in the sandpile monoid of a graph — Lima, Perú
December 2014

Workshop on algebraic statistics — Institute of Information Theory and Automation
Prague Stochastics 2014 — Prague, Czech Republic
Algebraic Statistics in R: Markov Bases — *August 2014*

Contributed Session — Texas A&M University
CombinaTexas 2014 — College Station, TX
Identifiability of structural equation models — *April 2014*

Special Session on Applied Combinatorics — CIMAT
Mathematical Congress of the Americas 2013 — Guanajuato, Mexico
Algebraic and combinatorial structure of sandpile monoids on digraphs — *August 2013*

Minisymposium Identifiability Problems in Biology and Stats. — Colorado State Univ.
SIAM Conference on Applied Algebraic Geometry — Fort Collins, CO
Identifiability of structural equation models on 6 random variables — *August 2013*

Minisymposium Approx. Theory, Geom. Modeling, and Alg. Geo. — Colorado State U.
SIAM Conference on Applied Algebraic Geometry — Fort Collins, CO
Toric degenerations of (irrational) Bézier patches — *August 2013*

Session on Algebraic Statistics — University of Louisville
Southern Regional Council on Statistics Research Conference — Burns, TN
Graphical causal models: An algebraic perspective — *June 2013*

Algebraic Geometry and Geometric Modeling Workshop — Banff IRS
The control polyhedron of a rational Bézier surface — Vancouver, Canada
January 2013

CombinaTexas 2012 — Southwestern University
Ideals of graph homomorphisms — Georgetown, TX
April 2012

MAA Invited Paper Session on Algebraic Statistics
2012 Joint Mathematics Meetings — Boston, MA
What is an Algebraic Statistical Model? — *January 2012*

Minisymposium on Graphical Statistical Models — North Carolina State University
First SIAM Conference on Applied Algebraic Geometry — Raleigh, NC
Parameter identification of structural equation models — *October 2011*

Kickoff Workshop on Algebraic Geometry in the Sciences — CMA, University of Oslo
Toric degenerations of Bézier patches — Oslo, Norway
January 2011

9^{th} **International Workshop ACCOTA** — Playa del Carmen, Quintana Roo, México
Ideals of graph homomorphisms — *November 2010*

$2^{\mathbf{nd}}$ **Southeast Texas Workshop on Discrete Math** — Sam Houston State University
What is algebraic statistics? — Huntsville, TX
October 2010

Parameter Identification in Graphical Models Workshop — American Inst. of Mathematics
Identifying causal effects with computer algebra — Palo Alto, CA
October 2010

Macaulay2 Workshop at Colorado College — Colorado Springs, CO
Algebraic statistics library for Macaulay2 — *August 2010*

Special Session on Advances in Algebraic Statistics — University of Kentucky
AMS 2010 Spring Southeastern Sectional Meeting — Lexington, KY
Identifiability of graphical models — *March 2010*

Special Session on Applications of Math Software to Math Research — ÉTS
International Conference on Applications of Computer Algebra — Montréal, Canada
Experimentation at the frontiers of reality in Schubert calculus — *June 2009*

Transition Workshop SAMSI
Algebraic Methods in Systems Biology and Statistics Research Triangle Park, NC
Applications of toric varieties in the sciences *June 2009*

2^{nd} **International Workshop on Alg. Geometry and Approx. Theory** Towson University
Geometric properties of toric patches Towson, MD
April 2009

Special Session on Mathematics of Biochemical Reaction Networks NCSU
2009 Spring AMS Southeastern Section Meeting Raleigh, NC
Injectivity of toric patches *April 2009*

SAMSI Two-Day Undergraduate Workshop SAMSI
2008-09 SAMSI Education and Outreach Program Research Triangle Park, NC
Introductory lecture on algebraic statistical models *February 2009*

Special Session on Computational Algebra and Convexity
2009 Joint Mathematics Meetings Washington, D.C.
Geometrical aspects of control points for toric patches *January 2009*

Workshop on Algebraic Statistical Models SAMSI
Algebraic Methods in Systems Biology and Statistics Research Triangle Park, NC
Algebraic methods for phylogenetic inference (poster) *January 2009*

8^{th} **International Workshop ACCOTA** Oaxaca City, Oaxaca, México
Sandpile models *December 2008*

8^{th} **International Workshop ACCOTA** Oaxaca City, Oaxaca, México
Algebra, geometry and combinatorics of sandpiles (poster) *December 2008*

Fourth Annual Texas Undergraduate Mathematics Conference SHSU
How to draw complex functions Huntsville, TX
September 2008

Workshop on Geometry and Representation Theory of Tensors MSRI
Phylogenetic algebraic geometry Berkeley, CA
July 2008

1^{st} **International Workshop on Alg. Geometry and Approx. Theory** Towson University
Linear precision for toric patches Towson, MD
April 2008

1^{st} **International Workshop on Alg. Geometry and Approx. Theory** Towson University
What is computational algebraic geometry? Towson, MD
April 2008

Special session on Toric Varieties University of Central Florida
32^{nd} **SIAM Southeastern-Atlantic Section Conference** Orlando, FL
Linear precision for toric patches *March 2008*

Second Workshop on Constructive Function Theory Sam Houston State University
Linear precision for toric patches Huntsville, TX
October 2007

IMA PI Summer Program in Applicable Algebraic Geometry Texas A&M University
Bézier curves and surfaces College Station, TX
July 2007

Workshop on Non-Linear Computational Geometry Applications IMA
Linear precision for parametric patches (poster) Minneapolis, MN
May 2007

Special Session on Computational Algebraic and Analytic Geometry
2007 Joint Mathematics Meetings — New Orleans, LA
Linear precision for parametric patches — *January 2007*

Special Session on Algebraic Geometry
Sixth Joint AMS–SMM International Meeting — Houston, TX
Algebraic geometry applications in Bayesian model selection — *May 2004*

Workshop on Algorithmic, Combinatorial and Applicable Real Alg. Geo. — MSRI
Topological Aspects of Real Algebraic Geometry — Berkeley, CA
Algebraic geometry applications in model selection — *April 2004*

Computational Algebraic Statistics — American Institute of Mathematics
Independence varieties of Bayesian networks — Palo Alto, CA
December 2003

Closing Workshop — SAMSI
Challenges in Stochastic Computation — Research Triangle Park, NC
Algebraic geometry of Bayesian networks with hidden variables — *June 2003*

Effective Methods in Algebraic Geometry Conference — Kaiserslautern, Germany
Algebraic geometry of Bayesian networks — *June 2003*

International School on Algebraic Statistics — Université Nice Sophia Antipolis
Grostat VI Conference — Nice, France
Algebraic classification of Bayesian networks — *February 2003*

Special Session on Systems
2002 SIAM Discrete Mathematics Conference — San Diego, CA
Classification of finite dynamical systems — *August 2002*

Graduate Oral Presentations in Mathematics
SACNAS National Conference — Phoenix, AZ
Mathematical foundations for computer simulations — *September 2001*

Graduate Oral Presentations in Mathematics
SACNAS National Conference — Atlanta, GA
Combinatorial tools for the analysis of decision systems — *October 2000*

Computational Algebra with Applications Conference — University of Wyoming
Computing Gröbner bases associated to finite modules — Laramie, WY
June 1999

Computational Algebra with Applications Conference — University of Wyoming
Computing syzygies à la Gauß-Jordan — Laramie, WY
June 1999

CIMAT-MSRI Conference on Gröbner Bases — CIMAT
Gröbner bases associated to finite modules — Guanajuato, México
February 1999

Colloquium and Seminar Talks

Pomona College Mathematics Colloquium — Claremont, CA
An Introduction to Algebraic Statistics — *September 2022*

Pomona College Algebra/Number Theory/Combinatorics Seminar — Claremont, CA
Arithmetical Structures — *September 2022*

University of Wisconsin-Milwaukee Mathematics Colloquium Milwaukee, WI
An Introduction to Algebraic Statistics *September 2022*

Trinity University Mathematics Seminar San Antonio, TX
An Introduction to Nonlinear Algebra *March 2022*

Lathisms: Café con Leche Lathisms: Latinxs and Hispanics in the Mathematical Sciences
Sandpile Monoids October 2021

Colorado College Mathematics & Computer Science Seminar Colorado Springs, CO
Estimating Gaussian Mixtures *October 2021*

Colorado College Mathematics & Computer Science Seminar Colorado Springs, CO
An Introduction to Algebraic Statistics *February 2021*

Sam Houston State University ProfSPEAK 2017-2018 speaker series Huntsville, TX
Modern Algebra Techniques in Theoretical Neuroscience *February 2018*

Sam Houston State University Teaching Seminar Huntsville, TX
Creating a Sustainable Undergraduate Research Program *September 2017*

The University of Texas at Tyler Mathematics REU Colloquium Tyler, TX
What is a sandpile group? *June 2017*

SHSU Department of Mathematics and Statistics Colloquium Huntsville, TX
Modern mathematics in cancer studies: The need for small data analysis *May 2017*

Northern Arizona University Special Interdisciplinary Colloquium Flagstaff, AZ
Modern mathematics in cancer studies: The need for small data analysis *April 2017*

Northern Arizona University Mathematics Colloquium Flagstaff, AZ
Modern Algebra Techniques in theoretical neuroscience studies *April 2017*

Northern Arizona University Honors Day Lecture Flagstaff, AZ
What is a sandpile group? *April 2017*

University of Kentucky Math Club Seminar Lexington, KY
Euclidean Steiner Tree Problem *March 2017*

University of Kentucky Discrete CATS Seminar Lexington, KY
What is a sandpile group? *March 2017*

University of Kentucky Applied Mathematics Seminar Lexington, KY
Algebraic Statistics Applications in Epidemiology *March 2017*

Texas A&M University Algebra and Combinatorics Seminar College Station, TX
Counting Arithmetical Structures *February 2017*

University of Houston Mathematics Colloquium Houston, TX
Toric degenerations of Bézier patches *April 2016*

Sam Houston State University Teaching Seminar Huntsville, TX
The Active Classroom *March 2016*

Southern Methodist University Statistical Science Seminar Dallas, TX
Identifiability of structural equation models *November 2014*

Reed College Mathematics Colloquium Portland, OR
Noncommutative Fourier analysis of partially ranked data *April 2014*

Cinvestav Mathematics Colloquium Cinvestav, Mexico City, México
Algebraic Geometry of Linear Structural Equation Models *August 2013*

Texas A&M Algebra and Combinatorics Seminar College Station, TX
Algebraic and combinatorial structure of sandpile monoids on directed graphs *April 2013*

Sam Houston State University Mathematics Colloquium — Huntsville, TX
Sandpile groups of book graphs — *November 2012*

Texas Tech University Mathematics Colloquium — Lubbock, TX
The control polyhedron of a rational Bézier surface — *November 2012*

Dartmouth College Mathematics Colloquium — Hanover, NH
The control polyhedron of a rational Bézier surface — *September 2012*

Pacific Undergraduate Research Experience Colloquium — Hilo, HI
Sandpile groups of book graphs — *July 2012*

Sam Houston State University Friday Afternoon Club — Huntsville, TX
Algebraic Statistics: Recent advances and future progress — *December 2011*

Texas State University Discrete Mathematics Seminar — San Marcos, TX
The control polyhedron of a rational Bézier surface — *December 2011*

Georgia Institute of Technology Algebra Seminar — Atlanta, GA
The control polyhedron of a rational Bézier surface — *November 2011*

Sam Houston State University Friday Afternoon Club — Huntsville, TX
Teaching Algebraic Structures using the ABC — *September 2011*

Duke University Algebraic Geometry Seminar — Durham, NC
Toric degenerations of Bézier patches — *April 2011*

Sam Houston State University Mathematics Colloquium — Huntsville, TX
Toric degenerations of Bézier patches — *March 2011*

Sam Houston State University Friday Afternoon Club — Huntsville, TX
How to draw complex functions — *January 2011*

Sam Houston State University Friday Afternoon Club — Huntsville, TX
What is Schubert calculus? — *November 2010*

University of Dallas Mathematics Colloquium — Dallas, TX
How to draw complex functions — *April 2010*

Southern Methodist University Research Colloquium — Dallas, TX
What is algebraic statistics ... good for? — *November 2009*

Coloquio del Instituto de Matemáticas — UNAM, Mexico City, México
The Geometry of Toric Patches — *April 2009*

Cinvestav Mathematics Colloquium — Cinvestav, Mexico City, México
The Geometry of Toric Patches — *April 2009*

North Carolina State University Symbolic Computation Seminar — Raleigh, NC
The Geometry of Toric Patches — *March 2009*

Clemson University Algebra and Discrete Mathematics Seminar — Clemson, SC
The Geometry of Toric Patches — *March 2009*

SAMSI Algebraic Statistics and Experimental Design Seminar — Res. Triangle Park, NC
Linear Precision of toric patches is ML degree 1 of toric statistical models — *February 2009*

Reed College Mathematics Colloquium — Portland, OR
The Geometry of Toric Patches — *February 2009*

Sam Houston State University Mathematics Colloquium — Huntsville, TX
What is algebraic statistics . . . good for? — *November 2008*

Sam Houston State University Mathematics Colloquium — Huntsville, TX
Phylogenetic Algebraic Geometry — *August 2007*

Texas A&M University Algebra and Combinatorics Seminar College Station, TX
Linear precision for multi-sided toric patches *March 2007*

North Carolina State University Mathematics Colloquium Raleigh, NC
What is algebraic statistics? *January 2007*

Sam Houston State University Mathematics Colloquium Huntsville, TX
Linear precision for multi-sided toric patches *January 2007*

Sam Houston State University Mathematics Colloquium Huntsville, TX
What is algebraic statistics? *November 2006*

Texas A&M University Algebra and Combinatorics Seminar College Station, TX
Finite Abelian p-groups and toric ideals *May 2006*

Texas A&M University Postdoc Seminar College Station, TX
What is algebraic statistics? *October 2005*

UC Berkeley Algebraic Statistics for Computational Biology Seminar Berkeley, CA
Catalog of small trees *March 2005*

MSRI Postdoc Seminar MSRI, Berkeley, CA
Minimal Cohen–Macaulay deformations of matroid ideals *December 2004*

Texas A&M University Algebraic Geometry Seminar College Station, TX
Solving the likelihood equations of small phylogenetic trees *November 2004*

Sam Houston State University Mathematics Colloquium Huntsville, TX
Tropical Mathematics *October 2004*

University of Washington Algebra Seminar Seattle, WA
Algebraic geometry of Bayesian networks *April 2004*

Georgia Tech Informal Geometry Seminar Atlanta, GA
Algebraic geometry of Bayesian networks *August 2003*

Instituto de Matemáticas Unidad Morelia Algebra Seminar UNAM, Morelia, México
Algebraic geometry of Bayesian networks *May 2003*

UC Berkeley Workshop on Algebraic Statistics Berkeley, CA
Algebraic geometry of Bayesian networks *January 2003*

University of Cantabria Algebra Seminar Santander, Spain
Algebraic geometry of Bayesian networks *December 2002*

University of Cantabria Combinatorics Seminar Santander, Spain
Resolutions of Cohen-Macaulay deformations of matroid ideals *December 2002*

Politecnico di Torino Algebraic Statistics Seminar Torino, Italy
Algebraic geometry of Bayesian networks *November 2002*

MSRI Combinatorial Commutative Algebra Seminar MSRI, Berkeley, CA
Resolutions of matroid ideals *August 2002*

Virginia Tech SIAM Graduate Student Seminar Blacksburg, VA
Resolutions of matroid ideals *March 2002*

Virginia Tech SIAM Graduate Student Seminar Blacksburg, VA
Combinatorics of the primary decomposition of Cohen-Macaulay monomial ideals *March 2002*

University of Bordeaux I Seminar Bordeaux, France
Mathematical foundations for computer simulations *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

- 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 (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 (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 Sullivant). 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 Sullivant). 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).