Zvi Rosen

Curriculum Vitae

Florida Atlantic University
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Education

Ph.D.	Mathematics, University of California, Berkeley. *Advisor*: Bernd Sturmfels. *Thesis*: Algebraic Matroids in Applications	May 2015
M.A.	Mathematics, University of Pennsylvania. Submatriculation joint with B.A. *Master's Thesis*: Graded Betti Numbers of Graph Curves	May 2011
B.A.	Mathematics, *summa cum laude*, University of Pennsylvania. Minor in Near-Eastern Languages and Civilizations.	Dec 2010

Employment

Assistant Professor, Florida Atlantic University. Department of Mathematical Sciences.	Aug 2018 –Present
Postdoctoral Researcher, University of California, Berkeley. Department of Statistics. Mentor: Yun S. Song.	Sep 2017 –Aug 2018
Simons Postdoctoral Fellow, University of Pennsylvania. Depts of Mathematics & Biology. Mentor: Yun S. Song.	Jan 2016 –Aug 2017
Visiting Researcher, The Pennsylvania State University. Department of Mathematics. Mentor: Vladimir Itskov.	Jun – Dec 2015

Research & Writing

Refereed Journal Articles

1. *Sparse moments of univariate step functions and allele frequency spectra*. (with Georgy Scholten and Cynthia Vinzant) Vietnam Journal of Mathematics 50 (2), 523-544, 2022. (Volume commemorating Bernd Sturmfels' 60th birthday)
2. *On the Number of Equilibria Balancing Newtonian Point Masses with a Central Force*. (with Nickolas Arustamyan*, Christopher Cox*, Erik Lundberg, and Sean Perry) Journal of Mathematical Physics 62 (11), 2021. ***High school students at time of submission**.
3. *Algebraic matroids in action.* (with Jessica Sidman and Louis Theran) The American Mathematical Monthly 127(3), 199-216, 2020. ***Awarded the 2021 Merten M. Hasse Prize by the MAA for writing by a younger mathematician.**
4. *Algebraic Signatures of convex and non-convex codes.* (with Carina Curto, Elizabeth Gross, Jack Jeffries, Katherine Morrison, Anne Shiu, and Nora Youngs) Journal of Pure and Applied algebra 223(9), 3919-3940, 2019.

5. *Geometry of the sample frequency spectrum and the perils of demographic inference.* (with Anand Bhaskar, Sebastien Roch, and Yun S. Song) Genetics 210(2), 665-682, 2018. ***Selected as Issue Highlight.**
6. *What makes a neural code convex?* (with Carina Curto, Elizabeth Gross, Jack Jeffries, Katherine Morrison, Mohamed Omar, Anne Shiu, & Nora Youngs) SIAM Journal on Applied Algebra and Geometry, 1(1), 222-238, 2017.
7. *The geometry of rank-one tensor completion.* (with Thomas Kahle, Kaie Kubjas, and Mario Kummer) SIAM Journal on Applied Algebra and Geometry, 1(1), 200-221, 2017.
8. *Matrix completion for the independence model.* (with Kaie Kubjas) Journal of Algebraic Statistics, 8(1), 1-21, 2017.
9. *Algebraic systems biology: a case study for the Wnt pathway.* (with Elizabeth Gross, Heather A. Harrington, & Bernd Sturmfels) Bulletin of Mathematical Biology, 78, 21-51, 2016.
10. *Parameter-free methods distinguish Wnt pathway models and guide design of experiments.* (with Adam L. MacLean, Helen M. Byrne, & Heather A. Harrington) Proceedings of the National Academy of Sciences, 112(9), 2652-2657, 2015.

Book Chapters and Conference Proceedings

1. *Combinatorial Commutative Algebra.* (with Felipe Rincón and Bernd Sturmfels) To appear in *Algebraic and Geometric Combinatorics: Proceedings of ECCO*.
2. *The Positive Grassmannian.* (with Laura Escobar and Alexander Postnikov) To appear in *Algebraic and Geometric Combinatorics: Proceedings of ECCO*.
3. *Hyperplane neural codes and the polar complex.* (with Vladimir Itskov and Alex Kunin) Topological Data Analysis 343-369, 2020.
4. *Algebraic tools for the analysis of state space models*. (with Nicolette Meshkat and Seth Sullivant) The 50th anniversary of Gröbner bases. Proceedings of Mathematical Society of Japan, 2015 Summer Institute, ASPM 77, 171-205.
5. *Line arrangements modeling curves of high degree: Equations, syzygies, and secants.* (with Gregory Burnham, Jessica Sidman, and Peter Vermeire) Recent Advances in Algebraic Geometry: A Volume in Honor of Rob Lazarsfeld's 60th Birthday, 417, 52, 2015.

Submitted for Review

1. *Oriented Matroids and Combinatorial Neural Codes*. (with Alex Kunin and Caitlin Lienkaemper) arXiv:2002.03542
2. *Convex neural codes in dimension 1*. (with Yan X. Zhang) arXiv:1609.07985.

Teaching

Assistant Professor, Florida Atlantic University.

MAC 2233	Methods of Calculus.	Fall 2022
MAS 6318	Advanced Algebra & Geometry.	Fall 2022
MAS 2103	Matrix Theory.	Spring 2022
MAS 6333	Commutative Algebra.	Fall 2021
MAD 2104	Discrete Mathematics.	Fall 2021
MAC 2313	Calculus & Analytic Geometry 3.	Spring 2021
MAS 4301	Modern Algebra.	Spring 2021
MAC 2312	Calculus & Analytic Geometry 2.	Fall 2020

MAS 4107	Linear Algebra.	Fall 2020
MAC 2312	Calculus & Analytic Geometry 2.	Spring 2020
MAD 6206	Enumerative Combinatorics.	Spring 2020
MAD 2104	Discrete Mathematics.	Spring 2019
MAC 2312	Calculus & Analytic Geometry 2.	Fall 2018

Instructor, University of Pennsylvania.

MATH 320	Computer Methods in Mathematics.	Fall 2016

Duties: Curriculum design; three weekly hours of instruction and one weekly office hour; writing and grading of homework assignments and quizzes; grading of final project.

Graduate Student Instructor, University of California, Berkeley.

Math 10B	Math for Life Sciences. Instructor: Per-Olof Persson	Spring 2014
Math 1B	Calculus 2. Instructor: Slobodan Simic	Spring 2012
Math 1B	Calculus 2. Instructor: Per-Olof Persson	Fall 2011

Duties: Three weekly hours of instruction and two weekly office hours; grading of homework assignments and quizzes; writing of quizzes; grading of final exam.

Fellowships & Awards

FAU Center for Online & Continuing Education (COCE) eDesign Grant *for designing online MAS 6333: Graduate Commutative Algebra* ($2500)	Expected 2022
FAU Early Career Academy Fellowship	Spring 2022
Merten M. Hasse Prize for Writing from the MAA ($1000)	2021
FAU Center for Online & Continuing Education (COCE) eDesign Grant *for designing online MAS 4107: Linear Algebra* ($5000)	2021
MAA Project NExT Fellow, Peach'18 Cohort	2018-2019
Visiting Graduate Student, Simons Institute for Computing, Berkeley	Fall 2014
Visiting Researcher, Max Planck Institute for Mathematics, Bonn	Fall 2013
Graduate Researcher, Research Group in Combinatorics, Berkeley	2012-2013
Phi Beta Kappa, University of Pennsylvania	2011

Invited Talks

Topology Seminar, Wesleyan University	Sep 21, 2022
Algebra Seminar, Tulane University	Apr 4, 2022
Workshop on Real Algebraic Geometry and Algorithms for Geometric Constraint Systems, The Fields Institute	Jun 14, 2021
Mathematical Biology Seminar, Georgia Tech	Apr 16, 2021
Spotlight: Science and Environment, Institute for Learning in Retirement (Boca Raton, FL)	Nov 23, 2020
Mathematics Undergraduate Seminar, Florida Atlantic University	Nov 19, 2020
Algebra Seminar, Florida Atlantic University	Feb 19, 2020
Algebra Seminar, Georgia Tech	Feb 17, 2020
Nonlinear Algebra Seminar, UC Berkeley	Feb 25, 2019
Combinatorics Seminar, University of Miami	Dec 3, 2018
Algebra Seminar, Florida Atlantic University	Nov 6, 2018
Analysis & Applications Seminar, Florida Atlantic University	Oct 11, 2018

Mathematics Undergraduate Seminar, Florida Atlantic University	Oct 8, 2018
Department Colloquium, Florida Atlantic University	Oct 5, 2018
CBMS: Applications of Polynomial Systems, TCU, Fort Worth, TX (Poster)	Jun 4, 2018
Biology & Medicine Through Mathematics Conference, VCU, Richmond	Jun 1, 2018
Lightning Talks, BSTARS, UC Berkeley	Mar 12, 2018
Song Group Seminar, UC Berkeley	Mar 5, 2018
Mathematics Colloquium, Florida Atlantic University, Boca Raton, FL	Feb 22, 2018
Algebra & Biology Section, Joint Mathematics Meetings, San Diego, CA	Jan 12, 2018
Song Group Seminar, UC Berkeley	Oct 18, 2017
Mathematical Biology Seminar, Penn State University.	Sep 14, 2017
SIAM Conference on Applied Algebraic Geometry, Algebraic Methods in Rigidity Theory Mini-symposium, Georgia Tech.	Aug 1, 2017
Applied Topology Seminar, Brown University.	Apr 13, 2017
Song Group Seminar, University of Pennsylvania.	Nov 10, 2016
Symbolic Computation Seminar, North Carolina State University.	Sep 20, 2016
Song Group Seminar, University of Pennsylvania.	May 18, 2016
Large Geometric Structures & Big Data Seminar, Aalto University, Helsinki.	Nov 9, 2015
MASS Applied Algebraic Geometry Seminar, Penn State University.	Oct 14, 2015
AMS Sectional Meeting, Loyola University, Chicago.	Oct 4, 2015
SIAM Chapter Meeting, UC Berkeley.	Apr 20, 2015
Applied Algebra and Network Theory Seminar, Penn State University.	Apr 8, 2015
Symbolic Computation Seminar, North Carolina State University.	Mar 31, 2015
Statistics Seminar, University of Kentucky.	Mar 30, 2015
Computational Algebraic Geometry Seminar, UC Berkeley.	Dec 1, 2014
Student Combinatorics Seminar, UC Berkeley.	Nov 24, 2014
Lightning Talks, Industry Day, Simons Institute of Computing.	Nov 7, 2014
AMS Fall Sectional Meeting, Combinatorial Commutative Algebra Session, San Francisco State University.	Oct 26, 2014
Prof. J.M. Landsberg's group, Simons Institute of Computing.	Oct 23, 2014
Combinatorics Seminar, San Francisco State University.	Oct 22, 2014
Seminar on Algebraic Combinatorics, Ben-Gurion University, Israel.	Dec 23, 2013
Computational Algebraic Geometry Seminar, Max-Planck Institute for Mathematics, Bonn, Germany.	Oct 7, 2013
Diskrete Geometrie Seminar. Freie Universität Berlin, Germany.	Jun 13, 2013
MEGA 2013. Goethe Universität, Frankfurt, Germany (Poster Presentation)	Jun 4, 2013
Macdonald Polynomials Seminar, UC Berkeley.	May 3, 2013
Valley Geometry Seminar, UMASS Amherst.	Apr 5, 2013
Bernd Sturmfels' Combinatorial Commutative Algebra course, UC Berkeley.	Nov 2012
ECCO'12 Combinatorics Conference, Universidad de Los Andes, Bogotá.	Jun 2012
Bernd Sturmfels' course in Algebraic Curves, UC Berkeley.	Dec 2011

Other Workshops & Conferences

Combinatorial, Computational, and Applied Algebraic Geometry (CCAAGS-22), Univ Washington Seattle, honoring Bernd Sturmfels' 60th birthday	Jun 2022
53rd Southeastern Combinatorics Conference (SEICCGTC)	Mar 2022
52nd Southeastern Combinatorics Conference (SEICCGTC)	Mar 2021

Mastery Grading Online Conference	Jun 2020
51st Southeastern Combinatorics Conference (SEICCGTC)	Mar 2020
Mathfest, Cincinnati, OH	Aug 2019
50th Southeastern Combinatorics Conference (SEICCGTC)	Mar 2019
Mathfest, Denver, CO	Aug 2018
Third NYA Population Genomics Workshop, Columbia University, New York	Jan 2017
2016 Conference on Theory & Biology, Simons Foundation, New York	Apr 2016
SAMSI Neural Network Workshop, Research Triangle Park, NC.	Mar 2016
Second NYA Population Genomics Workshop, Princeton University	Jan 2016
Joint Mathematics Meetings, San Antonio, TX	Jan 2015
IMA Modern Applications of Representation Theory, University of Chicago.	Jul 2014
AMS Math Research Communities: Algebraic and Geometric Methods in Applied Discrete Mathematics. Snowbird, UT.	Jun 2014
Algebraic Statistics 2014. Illinois Institute of Technology, Chicago, IL.	May 2014
Summer School in Algebraic Statistics, Nordfjordeid, Norway.	Jun 2013

Mentoring

Current Phd Students.

- **Matthew Trang**, Area of Research: combinatorial neural codes. Expected graduation: Spring 2024. — 2022 – present
- **David Urizar**, Area of Research: algebraic geometry of rigidity theory. Expected graduation: Spring 2023. — 2019 – present

Undergraduate Research Mentoring.

- **Yutong Wang**, Penn undergraduate, biostatistics project, joint with Khanh Dao Duc. — 2017

High School Research Mentoring.

- **Christopher Cox & Nickolas Arustamyan**, FAU High School, mathematical physics project, joint with Erik Lundberg. — 2020-2021
- **Mauricio Barba da Costa & Matthew Niemiro**, FAU High School & Illinois Mathematics and Science Academy, tropical geometry. — Summer 2020

Thesis Committees.

- **PhD**: Albert Madiny, Tran Ngo, David Snyder
- **MS**: Theresa Buscemi, Connor Watson

Editing & Refereeing

Journals Edited.

- Springer Proceedings in Mathematics & Statistics (PROMS), *Combinatorics, Graph Theory and Computing*, SEICCGTC 2021, joint with Frederick Hoffman, Sarah Holliday, Farhad Shahrokhi, and John Wierman. — Expected 2022
- Special issue of *Journal of Algebraic Combinatorics* in honor of the 50th SEICCGTC, joint with Martin Golumbic & Frederick Hoffman. — 2022

Peer Review.

❖ Refereed research articles for the following journals: 2017 - Present

1. IEEE Transactions on Information Theory
2. Advances in Mathematics
3. Journal of Combinatorial Theory A
4. International Mathematics Research Notices
5. PLoS One
6. The American Mathematical Monthly
7. Linear Algebra and its Applications
8. Journal of Mathematical Analysis and Applications
9. Vietnam Journal of Mathematics
10. Springer Proceedings in Mathematics and Statistics
11. ACM-SIAM Symposium on Discrete Algorithms
12. SIAM Journal of Discrete Mathematics
13. FAU Undergraduate Research Journal

❖ Reviewed four articles for AMS Math Reviews 2017-Present

❖ Reviewed a grant proposal for the European Research Council. 2020

Organizing & Service

Conferences.

❖ Mini-symposium on Matroids and Rigidity Theory at SEICCGTC, joint with Daniel Irving Bernstein. March 7-11, 2022

❖ Mini-symposium on Algebraic Neural Coding at SIAM Conference in Applied Algebraic Geometry, joint with Nora Youngs. July 9-10, 2019

❖ Two conferences at University of Pennsylvania, joint with Khanh Dao Duc and Yun S. Song:

—2nd Annual Penn Symposium on Mathematical & Computational Biology May 22-23, 2017

—Penn Symposium on Mathematical & Computational Biology May 23-24, 2016

Seminar Organizing.

❖ Organized reading group in Tropical Geometry at FAU Spring 2019

❖ Organized "Computational Algebraic Geometry" seminar at UC Berkeley jointly with Bernd Sturmfels Fall 2014

Committee Service.

❖ Hiring committee, cryptography search, FAU 2021 - 2022

❖ Graduate committee, FAU 2019 – present