

# JOSH HILLER

Associate Professor ◊ Department of Mathematics and Computer Science ◊ Adelphi University  
johiller@adelphi.edu

## EDUCATION

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- Ph.D. in Mathematics** *2014 - 2017*  
University of Florida  
*Thesis: On some variations of the multistage model of carcinogenesis.*
- M.S. in Applied Mathematics** *2012 - 2014*  
Western Carolina University
- B.A. in Mathematics, Magna Cum Laude** *2002 - 2005*  
Webster University in St. Louis

## PROFESSIONAL EXPERIENCE

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### Academic (Full Time)

1. Associate Professor of Mathematics and Computer Science, Adelphi University, Fall 2023-Present.
2. Assistant Professor of Mathematics and Computer Science, Adelphi University, Fall 2017-Summer 2023.
3. Alumni Fellow, University of Florida, Fall 2014-Summer 2017.

### Academic (Part Time)

4. Adjunct Doctoral Faculty in Global Leadership, Saint Mary of the Woods College, Summer 2023.
5. Adjunct Assistant Professor, Santa Fe College Summer 2016-Summer 2017.

### Non-academic (Full Time)

6. Internet Sales Manager, Apple Tree Automotive Group, 2010-2012.
7. Independent Financial and Statistics Consultant, 2005-Present.

## LEADERSHIP EXPERIENCE

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Research Director, Adelphi Summer Institute for Mathematical Epidemiology, Spring 2022-Present.

1. Planned 4-12 research projects a year for groups of high school and undergraduate students.
2. Helped supervise the staff of 4 to 8 undergraduate research assistants.
3. Consulted on \$70,000 annual budget with Program Director.

Program Director, MS in Applied Mathematics and Data Science, Adelphi University, Summer 2020-Spring 2023.

1. Led assessment and curriculum revision efforts.
2. Advised all graduate students.
3. Handled all marketing issues and admissions cases.

Executive Committee AAUP-AFT Local 6778

1. President, Summer 2019-Fall 2020 and Spring 2021-Spring 2023.

- (a) Chief executive for AAUP-AFT Local 6778, managing a budget of more than \$320,000 in union dues with both permanent and temporary staff.
  - (b) Increased reserves from \$500,000 to over \$725,000.
  - (c) Together with the Treasurer managed all financial and tax compliance issues including the preparation of reports and motions to approve spending.
2. Immediate Past President, Fall 2021-Spring 2021 and Spring 2023-Summer 2023.
- (a) Served as co-lead negotiator for a new 5 year contract covering over \$350,000,000 dollars and non-financial working conditions for our 1200 members.
  - (b) Advised the Executive Committee on discipline, grievances, and financial management of the union.
  - (c) Helped to train new staff.

## PUBLICATIONS (\* DENOTES STUDENT COAUTHOR)

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### Discrete or applied mathematics:

1. "Proving a generalized multinomial theorem by coloring set partitions," Keith Copenhaver, and Josh Hiller, *American Mathematical Monthly*, in press.
2. "Some involutory Pascal matrices make more involutory Pascal matrices", Keith Copenhaver, Josh Hiller, Andrew Velasquez-Berroteran\*, *College Journal of Mathematics*, <https://www.tandfonline.com/doi/pdf/10.1080/07468342.2024.2355854> , in press.
3. "Time to absorption in Markov Chains as a mixture distribution of hypo-exponential distributions", Josh Hiller, *Stochastics and Quality Control*, Vol. 38 (2), 119-123. 2023.
4. "A generalized binomial theorem for induced weak compositions", Josh Hiller, *Missouri Journal of Mathematical Sciences*, Nov. 2023.
5. "An axiomatic and historical review of the Armitage and Doll model of carcinogenesis." W. Zane Billings\*, Justin Clifton\*, Josh Hiller, Tommy Meek\*, Andrew Penland, Wesley Rogers\*, Gabriella Smokovich\*, Andrew Velasquez-Berroteran\*, Eleni Zamagias\*, *Spora: A Journal of Biomathematics*, 2022, Vol (8), 7-15. <https://doi.org/10.30707/SPORA8.1.1647886301.817127> .
6. "Minimally connected hypergraphs," Mark Budden, Josh Hiller and Andrew Penland, *Australian Journal of Combinatorics*, 2022 Vol (82.1). 1-20.
7. "Algebraic properties of a hypergraph lifting map," Mark Budden, Josh Hiller, Andrew Penland, and Tommy Meeks\*, *INTEGERS: Electronic Journal of Combinatorial Number Theory*, 2021, Vol 21, Article A77, 12 pages.
8. "Sierpinski products of r-uniform hypergraphs," Mark Budden and Josh Hiller, *The Art of Discrete and Applied Mathematics*, 2021, <https://doi.org/10.26493/2590-9770.1402.d50> , 15 pages.
9. "A very general binomial matrix", Leo Betthausen, Josh Hiller, and Omur Karaduman, *Notes on number theory and discrete mathematics*, 2021, 27(1), 125-133.
10. "Groups that have a Partition by commuting subsets," Tuval Foguel, Josh Hiller, Mark Lewis and Aliraza Moghaddamfar, *Journal of Group Theory*, November 2020, <https://doi.org/10.1515/jgth-2020-0065>, 19 pages.
11. "Constructive methods in Gallay-Ramsey theory for hypergraphs." Mark Budden, Josh Hiller, and Andrew Penland, *INTEGERS: Electronic Journal of Combinatorial Number Theory*, 2020, Volume 20(A), A4, 14 pages.

12. "A note on Abelian partitionable groups." Tuval Foguel and Josh Hiller, *Communications in Algebra*, Volume 48(8), 2020, 3268-3274.
13. "Policy lessons from spatial-temporal enrollment patterns in Argentina's payment for ecosystems services scheme." Mauricio Nunez-Regueiro, Lyn Branch, Josh Hiller, Cristina Nunez-Godoy, **Sharmin Siddiqui\***, Jose Volante, and Jose Soto, *Land Use Policy*, 2020, Vol 95, 8 pages, 12 pages supplementary data analysis.
14. "On Bruck's prolongation and contraction maps," Tuval Foguel and Josh Hiller; *Quasigroups and related systems*, 2019, 53-62.
15. "Asymptotic relative risk results from a simplified Armitage and Doll model of carcinogenesis," Josh Hiller and James Keesling; *Bulletin of Mathematical Biology*, 2018, 80(3), 670-686.
16. "On the lexicographic product of  $k$ -uniform hypergraphs with an application to Ramsey theory," **Melody Bruce\***, Mark Budden, and Josh Hiller; *Australasian Journal of Combinatorics*, 70(3), 2018, 390-401.
17. "The adjacency-Pell-Hurwitz numbers," Josh Hiller, Yesim Akuzum, and Omur Deveci; *INTEGERS: Electronic Journal of Combinatorial Number Theory*, 2018, 18(A83), 16 pages.
18. "Characteristic patterns of cancer incidence: Epidemiological data, biological theories, and multistage models, " Josh Hiller, Celeste Vallejo, Leo Betthausen, and James Keesling, *Progress in Biophysics and Molecular Biology*, 2017, Vol. 124, 41-48.
19. "The lifting of graphs to 3-uniform hypergraphs and some applications to hypergraph Ramsey theory, " Mark Budden, Josh Hiller, Joshua Lambert, and **Christopher Sanford\***; *Involve: a journal of mathematics*, 2017, Vol. 10(1), 65-76.
20. "Hypergraph Ramsey numbers involving paths, " Mark Budden, Josh Hiller, and Aaron Rapp; *Acta Universitatis Apulensis*, 2016, Vol. 48(7) 75-87.
21. "A note on subloop lattices, " Tuval Foguel and Josh Hiller; *Results in Mathematics*, 2016, Vol. 69(1-2), 11-21.
22. "Old friends in unexpected places: Pascal (and other) matrices in  $GL_n(C)$ ," Josh Hiller; *American Mathematical Monthly*, 2016, Vol. 123(2), 161-167.
23. "Generalized Ramsey theorems for  $r$ -uniform hypergraphs," Mark Budden, Josh Hiller, and Aaron Rapp; *Australasian Journal of Combinatorics*, 2015, Vol. 63(1), 142-152.
24. "A proof of two conjectures of Deveci and Karaduman," Josh Hiller; *Linear Algebra and its Applications*, 2014, Vol. 446, 163-165.

### **Humanistic mathematics:**

25. "The poetry of category theory," Josh Hiller, *American Mathematical Monthly*, in press.
26. "The point at infinity," Josh Hiller, *Journal of Humanistic Mathematics*, Vol. 14(1), 2024.
27. "Decolonization of the curricula: beyond historical enrichment", Josh Hiller, *The Mathematical Intelligencer*, Vol 45 (4), 295, 2023.
28. "Conditional life expectancy", Josh Hiller, *The Mathematical Intelligencer*, April 2023, Vol 45, 175-176.
29. "A topologist's broken heart", Josh Hiller, *Journal of Humanistic Mathematics*, Vol(12), Issue 2, 2022, <https://scholarship.claremont.edu/jhm/vol12/iss2/36/> , 1 page
30. "A Topology haiku matrix", Josh Hiller, *Mathematical Gazette*, November 2021, 1 page.

31. “Fibonacci’s bunny-pocalypse!”, Josh Hiller, *The American Mathematical Monthly*, Jan. 2021, Vol. 128(1), 75.
32. “God whispered to Cantor”, Josh Hiller, *Mathematical Intelligencer*, 2021, <https://doi.org/10.1007/s00283-020-10035-9>, 1 page.

#### Other writings:

33. “Mending the leaky pipeline,” Josh Hiller and Eugenia Villa-Cuesta, *The Times Higher Education*, May 2024.
34. “My heart attack would have killed my livelihood if I’d still been an adjunct,” Josh Hiller, *The Times Higher Education*, Jan 2024.
35. “Interdisciplinary questions: the academy’s most misunderstood fields”, *The Times Higher Education*, with eight other contributors, May 2021.
36. “I’m working 50 unpaid hours a week and I fear for my job”, *The Times Higher Education*, August 2020.
37. “We have to do better than pausing the tenure clock, Reem Khamis-Dakhar and Josh Hiller *InsideHigherEd*, July 2020.
38. “Misinterpretation vs. misunderstanding: A look at ESL students,” *WLN: A journal of writing center scholarship*, 2004, Vol. 29.4, 10-11.

## CONFERENCE PRESENTATIONS AND EXTERNAL TALKS

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### Invited Talks

1. Graph Theory Days 80, CUNY Graduate Center, Nov. 2024 “*Hypergraphs and a model from epidemiology.*” (Plenary talk)
2. Pohle Colloquium, Adelphi University, Dec. 2019, “*An axiomatic and historical look at Armitage and Doll carcinogenesis.*”
3. Applied Ecology Laboratory Seminar Series (National University of Salta), Sep. 2018, Ciudad Capital Salta, Argentina, “*A simple stochastic model of deforestation in the Gran Chaco forest.*” (in Spanish)
4. Amity Lecture Series, June 2018, Garden City NY “*Beyond the promise: The perils of Big Data.*”
5. MAA SE Sectional meeting, Special Session on Discrete Mathematics, March 2018, Clemson SC, “*Random walks and cancer data.*”
6. Hofstra Mathematics Colloquium, March 2018, “*Some simple mathematical models for cancer incidence and relative risk.*”
7. CUNY Graduate Center, Feb. 2018, NYC NY, “*On Burch’s prolongation and contraction maps.*”
8. Western Carolina University Mathematics Colloquium, Feb. 2018, Cullowhee NC, “*Multistage models of carcinogenesis.*”

### Contributed talks

9. MAA NYC Metro Sectional Meeting, May 2020, Queens College, “*Modeling the propagation of competing ideas in social networks through combinatorial games.*”
10. JMM, Jan. 2020, Denver, “*Combining statistical literacy with real world data-skills: What should a first course in data science for computer science majors cover?*”

11. NYC regional MAA Meeting, May 2018, Hofstra University, *“Integrating Proof Writing and Mathematical Communication Skills Throughout the Mathematics Curriculum (Preliminary Report).”*
12. JMM, Jan. 2018, UC San Diego, *“Modeling market based deforestation prevention policy: the effect of fluctuating commodity prices and industrial agriculture.”*
13. SMURCHOM VII, April 2014, Western Carolina University, *“Felix Klein and his lemma.”*
14. MAA SE Sectional meeting, March 2014, Tennessee Technical University, *“A new twist on the Ping-Pong Lemma...and why we care.”*
15. SERMON 2013, April 2013, High Point University, *“A generalization of Fermat’s Little Theorem to non-singular integer matrices with integer eigenvalues.”*
16. MAA SE Sectional meeting, March 2013, Winthrop University, *“On a relation between Pascal matrices and arbitrary matrices over the complex numbers.”*

## AWARDS AND ACHIEVEMENTS

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### Grants

1. SIAM-Simons Undergraduate Summer Research Program Site, in support of “Effectiveness of market based deforestation prevention strategies: modeling the effect of fluctuating commodity prices and industrial agriculture” (Summer 2025), \$41,904.
2. AMS Epsilon Fund Grants for Young Scholars Programs (Summer 2024), \$5,000 in support of “The Adelphi Summer Institute in Mathematical Epidemiology (ASIME): an immersive six-week experience for mathematically talented high school students with substantial enrollment from underrepresented demographic groups,” jointly with Dr. Anil Venkatesh.
3. AMS Epsilon Fund Grants for Young Scholars Programs (Summer 2023), \$2,600 in support of “The Adelphi Summer Institute in Mathematical Epidemiology (ASIME): an immersive six-week experience for mathematically talented high school students with substantial enrollment from underrepresented demographic groups,” jointly with Dr. Anil Venkatesh.
4. AMS Epsilon Fund Grants for Young Scholars Programs (Summer 2022), \$2,500 in support of “The Adelphi Summer Institute in Mathematical Epidemiology (ASIME): an immersive six-week experience for mathematically talented high school students with substantial enrollment from underrepresented demographic groups,” jointly with Dr. Anil Venkatesh.
5. Council for Undergraduate Research in Mathematics mini-grant award (2020-2021), \$17,900 of external funding with \$9,000 of internal funding in support of: “Hypergraph models of in mathematical oncology.”
6. Council for Undergraduate Research in Mathematics mini-grant award (2019-2020), \$14,900 of external funding in support of: “Hypergraph models of carcinogenesis.”

### Fellowships, awards, or honors

7. The 2024 Insight Into Diversity Inspiring Programs in STEM Award. Awarded to Adelphi Summer Institute for Mathematical Epidemiology.
8. Alumni Fellowship (2014-2018), University of Florida, \$25,000/year for four years.
9. Dean’s Outstanding Scholar Award (2014), Western Carolina University, Graduate School.
10. Department of Mathematics Outstanding Graduate Student Award (2014), Western Carolina University, Department of Mathematics and Computer Science.
11. Supplemental Research Stipend (2014), Western Carolina University, Graduate School, \$1,000 in support of “Explicit generating sets for Free Groups”.

12. Supplemental Research Stipend (2013), Western Carolina University, Graduate School, \$1,000 in support of “Pascal Matrices.”

## MEMBERSHIP

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Mathematical Association of American, American Association of University Professors, American Mathematical Society.

## SERVICE

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### To the profession

1. Chair of Theoretical Ecology for the Southern Cone Chapter of the Society for Conservation Biology (Summer 2016-2019)
2. Referee for (number of articles since coming to Adelphi):
  - Post-tenure application: The Computer Journal (1), Journal of difference equations and applications (1), BIRS project applications (10), Algorithms (1), College Journal of Mathematics (1).
  - Pre-tenure application: Journal of biological dynamics (1), Journal of biological systems (4), Maejo international journal of science and technology (1), Wiley Books proposals (1), Notes on number theory and discrete mathematics (4), Communications in Algebra (1), Involve: A journal of mathematics (1), College mathematics journal (2).

### To Adelphi

1. Department
  - (a) MS in Applied Mathematics and Data Science program director, (Summer 2020-Present).
  - (b) Applied Math Tea, facilitator (Fall 2018-Spring 2019).
  - (c) Attended freshman orientation sessions, 4 in total, (July 2019).
  - (d) Department representative for Adelphi University Open House, Fall 2017-Present (five times).
  - (e) Department representative at the graduate fair of the JMM Jan. 2018.
  - (f) Department representative at the Fields of Dreams Conference Graduate student fair and Employment fair Nov. 2018.
  - (g) Department representative at the graduate fair of the SE Regional MAA Meeting March 2018.
  - (h) Putnam problem session leader Fall 2017/2018.
  - (i) Served on 9 (5 Tenure Track, 3 VAP, 1 Lecturer) hiring committees.
  - (j) Committee to improve communications skills in mathematics majors, Chair (Fall 2018-Spring 2019), Sal Petrilli Chair.
  - (k) MAA Liaison (3 years).
  - (l) Primary author of the CS program self-study (Spring 2018), 165 pages.
2. College
  - (a) College of Arts and Sciences Diversity and Inclusion Committee (Now Diversity and Inclusion Council), member (Spring 2018-Fall 2020), Anthony Dotterman, Co-Chair.
  - (b) Search committee for Assistant Professor of Quantitative Ecology and Evolution, member, Matthias Foellmer, Chair.

(c) Presented in the CAS Salon Faculty Series, September 2020.

3. University

(a) Faculty Senate Committee for Student Admission and Retention, member (Fall 2018-Fall 2021; Chair Fall 2019-Summer 2021, past chair Lee Stemkoski, Current Chair Cindy Maguire).

(b) Senate Finance Committee, member (Spring 2020-Fall 2020), Winston Waters, Chair.

(c) Member of Search Committee to Select new Associate Provost for Student Success.

(d) AAUP Chapter Executive Committee, member (Secretary, Spring 2019-Summer 2019; Interim President, Summer 2019-Fall 2020; Immediate Past President, Fall 2021-Spring 2021, President, Spring 2021-Spring 2023).

(e) Total Enrollment Restart Task Force member (Summer 2020), Kristen Capezza, Chair.

(f) Student Success Restart Task Force member (Summer 2020), Peter West, Chair.

(g) Associate Provost for Student Success Search Committee member (Summer 2020), Chris Storm, Chair.

(h) Student Orientation to Online Learning Task Force member (Summer 2020), Liz Ciabacci, Chair.

(i) Applied Sciences and Engineering Task Force, member (Fall 2020), Liz Ciabacci, Chair.

## COURSES TAUGHT

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### Computer Science

Adelphi: Introduction To Computers and Their Applications, Introduction to Computer Programming (Lecture), Explorations in Computer Coding and Data Manipulation, Seminar in Software Engineering, Programming for Applied Mathematics

### Mathematics

Adelphi: Precalculus, Analysis, Senior Seminar, Calculus I, Senior Seminar II, Statistics and Data Analytics Internship-Programming Analytics, Statistics and Data Analytics Internship II, Regression Analysis, Current Topics in Statistics, Mathematical Statistics, Introduction To Probability Theory, S/T:Experimental Design, Social Science Seminar: A Mathematician's Apology- Scientists on Science, Foundations for Advanced Mathematics, Data Science, Introduction to Ordinary Differential Equations, Statistical Consulting Practicum, Graduate Capstone in the Mathematical Sciences, Advanced Statistical Procedures, Big Data Analytics, Games Mathematicians Play, Mathematics Honors Seminar, Bridge to Higher Mathematics.

Additional Courses Elsewhere: Introduction to Logic, Survey of Mathematics, Topics in Mathematics for Liberal Arts, Quantitative Methods in Global Leadership.

## SKILLS

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1. **Languages:**

English/Spanish: Native level fluency.

2. **Software/Programming Languages**

R, C++, LaTeX, MATLAB, Excel, Python.