

# CHRISTINA DURÓN

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## ACADEMIC EMPLOYMENT

### Assistant Professor of Mathematics

*Natural Science Division of Seaver College, Pepperdine University*

Aug 2022 – Present

### Postdoctoral Research Associate

*Department of Mathematics, University of Arizona*

Aug 2019 – May 2022

### High School Teacher

*Mathematics Department, The Webb Schools of California*

Aug 2013 – June 2019

## RESEARCH INTERESTS

Network Theory; Network Dynamics; Statistical Analysis and Modeling of Complex Networks; Mathematical-Biology

## EDUCATION

### Claremont Graduate University

*Ph.D. in Mathematics*

May 2019

- **Thesis:** The Distribution of Betweenness Centrality in Exponential Random Graph Models
- **Advisors:** Dr. Ami Radunskaya (Professor, Pomona College) and Dr. Johanna Hardin (Professor, Pomona College)

### University of Washington

*Master's in Applied Mathematics*

June 2013

### Swarthmore College

*Bachelor of Arts in Mathematics; Minor in Computer Science*

May 2012

## PUBLICATIONS \*

8. Durón C, Swansen B<sup>†</sup>, Kravitz H. (Accepted Sept 2023). Difference Approximation. *Wiley StatsRef: Statistics Reference Online*.
7. Sullivan N, Durón C, Pfeffer D. (2023). From Mirrors to Wallpapers: A Virtual Math Circle Module on Symmetry. *Journal of Math Circles*: Vol. 3: Iss. 1, Article 1. Available at <https://digitalcommons.cwu.edu/mathcirclesjournal/vol3/iss1/1>.
6. Durón C. (2022). Adaptive Quadrature. *Wiley StatsRef: Statistics Reference Online* (eds N. Balakrishnan, T. Colton, B. Everitt, W. Piegorsch, F. Ruggeri and J.L. Teugels). doi: [10.1002/9781118445112.stat08388](https://doi.org/10.1002/9781118445112.stat08388)
5. Durón C, Farrell A. (2022). A Mean-Field Approximation of SIR Epidemics on an Erdős-Rényi Network Model. *Bulletin of Mathematical Biology*, 84(7): 1 – 19. doi: [10.1007/s11538-022-01026-2](https://doi.org/10.1007/s11538-022-01026-2)
4. Durón C. (2021). Linear Algebra, Computational. *Wiley StatsRef: Statistics Reference Online* (eds N. Balakrishnan, T. Colton, B. Everitt, W. Piegorsch, F. Ruggeri and J.L. Teugels). doi: [10.1002/9781118445112.stat00459.pub2](https://doi.org/10.1002/9781118445112.stat00459.pub2)
3. Durón C. (2020). Heatmap Centrality: A New Measure to Identify Super-Spreader Nodes in Scale-Free Networks. *PLoS ONE*, 15(7): e0235690. doi: [10.1371/journal.pone.0235690](https://doi.org/10.1371/journal.pone.0235690)

\* Authors are ordered by contribution.

<sup>†</sup> Undergraduate student.

2. **Durón C**, Pan Y, Gutmann D.H., Hardin J, & Radunskaya A. (2018). Variability of Betweenness Centrality and Its Effect on Identifying Essential Genes. *Bulletin of Mathematical Biology*, 81(9): 3655 – 3673. doi: [10.1007/s11538-018-0526-z](https://doi.org/10.1007/s11538-018-0526-z)
1. Pan Y, **Durón C**, Bush E.C., et al. (2018). Graph Complexity Analysis Identifies an ETV5 Tumor-Specific Network in Human and Murine Low-Grade Glioma. *PLoS ONE*, 13(5): e0190001. doi: [10.1371/journal.pone.0190001](https://doi.org/10.1371/journal.pone.0190001)

## UNDER REVIEW \*

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2. O'Brien E, **Durón C**. (Feb 2024). The Wasserstein metric as a tool to assess burn-in and convergence. *Statistical Science*.
1. Kravitz H, **Durón C**, Brio M. (Sept 2023). A coupled spatial-network model for epidemiology. *Bulletin of Mathematical Biology*.

## IN PREPARATION \*

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2. **Durón C**, Mello J<sup>†</sup>, Kamps K<sup>†</sup>. Using Networks to Evaluate an Infrastructure's Condition During Seismic Activity.
1. Pfeffer D, **Durón C**. An Unlikely Duo: Injecting Art Projects in the Mathematics Classroom.

## RESEARCH POSITIONS

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### Graduate Research Assistant

Jan 2017 – June 2018

Pomona College

- NIH (1R01-CA195692-01) funding under Dr. Ami Radunskaya and Dr. Johanna Hardin

### Jet Propulsion Laboratory (JPL) Intern

June 2015 – August 2015

California Institute of Technology

- Implemented the Extended Kalman Filter (EFK) and incorporated inter-robot measurements to improve the state estimation and localization of autonomous vehicles

### Mathematical and Theoretical Biology Institute Researcher

June 2011 – July 2011

Arizona State University

- Developed a mathematical model for the evaluation and analysis of the air pollution in Los Angeles

## TEACHING EXPERIENCE

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### Instructor of Record

Pepperdine University

- **MATH 450: Mathematical Statistics** Spring 2024
- **MATH 350: Mathematical Probability** Fall 2023
- **MATH 260: Linear Algebra** Spring 2023
- **MATH 150: Calculus I** Fall 2022, Spring 2023,  
Fall 2023, Spring 2024

### Instructor of Record

University of Arizona

- **MATH 491: Undergraduate Teaching Assistantship (UTA) Seminar** Fall 2021 – Spring 2022
- **MATH 196M: Calculus I Supplementary Seminar** Spring 2022

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\* Authors are ordered by contribution.

† Undergraduate student.

• MATH 396L: Wildcats Proofs Workshop	Spring 2022
• MATH 464: Theory of Probability	Fall 2021
• MATH 363: Introduction to Statistical Methods	Spring 2021
• MATH 129: Calculus II	Fall 2020
• MATH 475A: Mathematical Principles of Numerical Analysis	Fall 2020
• MATH 163: Basic Statistics	Spring 2020
• MATH 122B: First Semester Calculus	Fall 2019
• MATH 196L: Precalculus Supplementary Seminar	Fall 2019

#### Instructor of Record

*The Webb Schools of California*

• Advanced Placement Computer Science Principles	Fall 2018 – Spring 2019
• Introduction to Computer Programming with Python	Fall 2014 – Spring 2018
• Honors Precalculus	Fall 2014 – Spring 2019
• Precalculus	Fall 2013 – Spring 2019
• Integrated Mathematics 2	Fall 2013 – Spring 2014

## PRESENTATIONS

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#### Student-Directed

2. <b>Using Networks to Evaluate an Infrastructure's Condition During Seismic Activity: A Proposed Approach</b> <i>JMM: AMS - PME Undergraduate Student Poster Session</i>	Jan 2024
1. <b>Using Networks to Evaluate an Infrastructure's Condition During Seismic Activity: A Proposed Approach</b> <i>Pepperdine University, Natural Science Division Summer Research</i>	July 2023

#### Contributed

6. <b>Math Circles: Elevating Student Engagement and Mathematical Enjoyment Outside the Classroom</b> <i>University of Arizona Mathematics Educator Appreciation Day Conference (MEAD)</i>	Jan 2024
5. <b>Incorporating Undergraduate Students in Research on Assessing Dam Safety Using Network Analysis</b> <i>JMM Special Session: Navigating the Benefits and Challenges of Mentoring Students in Data-Driven Undergraduate Research Projects</i>	Jan 2024
4. <b>Tiling a Chessboard: A Problem Adapted for the Virtual Math Circle</b> <i>JMM Special Session: Math Circle Activities as a Gateway into Mathematics</i>	Jan 2023
3. <b>A Mean Field Approximation of SIR Epidemics on an Erdős-Rényi Network Model</b> <i>Los Alamos-Arizona Days Conference (Virtual Poster)</i>	May 2021
2. <b>Identifying Super-Spreader Nodes in Scale-Free Networks using Network Centrality Measures</b> <i>Arizona Postdoctoral Research Conference (Virtual Talk)</i>	Sept 2020
1. <b>Identifying Treatment Targets for Pediatric Gliomas using Network Centrality Measures</b> <i>SIAM Conference on the Life Sciences (Virtual Talk)</i>	June 2020

## Seminar

4. **A Coupled Spatial-Network Model for Epidemiology** Nov 2023  
*University of Florida, Health Systems Medicine Seminar (Virtual Talk)*
3. **Network Centrality: Theory to Applications** Oct 2021  
*Arizona State University, Mathematical Biology Seminar (Virtual Talk)*
2. **Heatmap Centrality: A New Measure to Identify Super-Spreader Nodes in Scale-Free Networks** Feb 2021  
*Claremont Colleges and University of Utah, Joint Applied Mathematics Seminar (Virtual Talk)*
1. **Network Data Analysis Techniques on DESeq and RNASeq Data** Nov 2019  
*University of Arizona, TRIPODS Research Working Group 6 - Analyzing large-scale point-set data*

## Industry

1. **Network Evaluation of Influential Sensors: A Proposed Approach<sup>‡</sup>** Nov 2023  
*Southern California Edison, Dam & Public Safety Group*

## PROFESSIONAL DEVELOPMENT

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### Program

- **Project NExT** (Green 2023) Aug 2023 – Aug 2024  
*Mathematical Association of America (MAA)*
  - Focused on all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, finding exciting and interesting service opportunities, and participating in professional activities

### Certification

- **Diversity, Equity, and Inclusion in the Workplace** May 2021  
*University of South Florida*
  - Focused on ways that organizations can create a more diverse workplace, address equity issues, and foster inclusivity
- **Effective Online Discussions** June 2020  
*University of Arizona*
  - Developed strategies for designing and facilitating effective online discussions that deepen learning, expand student exposure to curriculum, and increase student engagement
- **Teaching the Large Online Course** June 2020  
*University of Arizona*
  - Developed instructional practices for encouraging student engagement and motivation in a large online class, as well as for effectively managing administrative tasks such as monitoring student progress and conducting assessments

### Workshops

- **Network Modeling for Epidemics** Aug 2020  
*University of Washington*
- **BioBridge Clinic** Jan 2020  
*University of California, Irvine*
- **Computational Genomics Summer Institute** May 2019  
*University of California, Los Angeles*

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<sup>‡</sup> Presented with undergraduate students.

## SERVICE

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### Mentoring and Advising

- **Undergraduate Research Advisor** (Team of 2 undergraduates)  
*Pepperdine University* Summer 2023 – Present
- **Math Club Vice-Principal Faculty Advisor**  
*Pepperdine University* Spring 2023 – Fall 2023
- **Undergraduate Student Mentor**  
*Pepperdine University, Faculty/Student Mentor Program* Spring 2023 – Fall 2023
- **Undergraduate Student Mentor**  
*University of Arizona, Women in Science and Engineering (WISE) Program* Fall 2021 – Spring 2022
- **Graduate Student Mentor**  
*University of Arizona, Association for Women in Mathematics (AWM) Mentor Network* Fall 2021 – Spring 2022
- **Undergraduate Research Advisor**  
*University of Arizona* Fall 2020 – Spring 2021
- **Mathematics Undergraduate Teaching Assistantship (UTA) Program Mentor**  
*University of Arizona* Fall 2020 – Spring 2021
- **Mathematical Modeling Group Mentor** (Team of 4 undergraduates)  
*University of Arizona* Spring 2020
- **Math Club Advisor**  
*The Webb Schools of California* Fall 2017 – Spring 2019

### University and Departmental Service

- **Institutional Review Board, Natural Science Representative**  
*Pepperdine University* Fall 2023 – Present
  - Review research study protocol/application materials (exempt, expedited, and full review) and evaluate them from the perspective of the regulatory criteria for approval.
- **Admissions and Scholarship Committee**  
*Pepperdine University* Fall 2023 – Present
  - Review student applications and select Faculty-Staff Scholars based on merit, including academic performance and recommendations.
- **Co-Instructor of RISE/Connection Chapel**  
*Pepperdine University* Fall 2023
  - Facilitated discussions on different aspects of science from the Christian perspective, primarily in the disciplines of history, physics, astronomy, and mathematics, with students over five sessions
- **Member of Hiring Committee, Assistant Professor of Mathematics (AY 24/25)**  
*Pepperdine University* Fall 2023 – Spring 2024
  - Served on the seven-member review committee whose duties included reading through application packages, conducting virtual interviews via Zoom and in-person interviews on campus, collecting and consolidating information about the interviews, and making final recommendations
- **Member of Hiring Committee, Visiting Assistant Professor of Mathematics (AY 23/24)**  
*Pepperdine University* Summer 2023
  - Served on the five-member review committee whose duties included reading through application packages, conducting virtual interviews via Zoom, collecting and consolidating information about the interviews, and making final recommendations

- **Member of Hiring Committee, Assistant Professor of Mathematics (AY 23/24)** *Fall 2022 – Spring 2023*  
*Pepperdine University*

  - Served on the seven-member review committee whose duties included reading through application packages, conducting virtual interviews via Zoom and in-person interviews on campus, collecting and consolidating information about the interviews, and making final recommendations
- **Member of Review Committee, Excellence in Postdoctoral Mentoring Award** *Spring 2022*  
*University of Arizona*

  - Served on the three-member review committee that determined the recipient of the 2022 Excellence in Postdoctoral Mentoring Award
- **President, Postdoctoral Governance** *Fall 2021 – Spring 2022*  
*University of Arizona*

  - Serve as an in-between for the postdocs and the Postdoctoral Committee, and organize the postdoctoral professional development seminar topics and panels
- **Mathematics Undergraduate Teaching Assistantship (UTA) Program, Director** *Fall 2021 – Spring 2022*  
*University of Arizona*

  - Coordinate the mentorship of the UTA's, and run the weekly professional development seminar
- **Mathematics Undergraduate Teaching Assistantship (UTA) Program, Co-Director** *Fall 2020 – Spring 2021*  
*University of Arizona*

  - Supported the Director of the UTA Program, and was responsible for additional duties related to the weekly professional development seminar
- **Vice President, Postdoctoral Governance** *Fall 2020 – Spring 2021*  
*University of Arizona*

  - Supported the President of the Postdoctoral Governance, and was responsible for additional duties related to the postdoctoral professional development seminars
- **Non-Academic Liaison, Postdoctoral Governance** *Spring 2020*  
*University of Arizona*

  - Organized a panel pertaining to non-academic careers for the postdoctoral professional development seminar

#### Service to the Discipline

- **JMM 2024, Co-Organizer of MAA Project NExT Session** *Jan 2024*  
*Pepperdine University*

  - “Making Student Thinking Visible with Team-Based Inquiry Learning”
- **MAA MathFest 2022, Co-Organizer of Themed Contributed Paper Session** *Aug 2022*  
*University of Arizona*

  - “Math Circles: Talks about Mathematical Joy, Inspirations, and Data-Driven Lessons Learned”
- **Reviewer for:**

  - Complexity *March 2023*
  - Indian Journal of Discrete Mathematics *Nov 2020*
  - DNA and Cell Biology *Jan 2020*
  - Revista de Matemática: Teoría y Aplicaciones *Oct 2019*
- **Mathematics and MATLAB Summer Workshop, Co-Coordinator** *June 2016 – June 2018*  
*Claremont Graduate University*

- **Mathematics and MATLAB Summer Workshop, Co-Instructor**  
*Claremont Graduate University*

*June 2016 – June 2017*

## Outreach

- **How I Found My Network: My Path to Mathematics** *Nov 2021*  
*Arizona State University*
  - Keynote address for Sonia Kovalevsky Day
- **Tucson Math Circle** *Aug 2019 – Present*  
*University of Arizona*
  - Co-develop materials and co-run the university sponsored weekly program designed to get middle school students excited about mathematics through hands-on exploration and discovery
- **Association for Women in Mathematics (AWM): Sonia Kovalevsky Day** *April 2021*  
*University of Arizona*
  - Developed materials and co-ran a workshop designed to bolster female high school and middle school students' passion and enthusiasm for mathematics in a supportive environment
- **The Seven Bridges of Königsberg** *Nov 2022*  
*Pepperdine University*
  - Talk given to Math Club during Tuesday Tea
- **Using Network Centrality Measures to Identify Unknown Regulatory Pathways in Pediatric Glioma** *Sept 2020*  
*University of Arizona*
  - Talk given to The MathCats Club (undergraduate math club)

## HONORS AND AWARDS

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| <p><b>The Teaching and Service Award</b><br/><i>University of Arizona, Department of Mathematics</i></p> <p><b>The Jean E. Miller Excellence in Teaching Award</b><br/><i>The Webb Schools of California</i></p> <p><b>The Thompson and Vivian Webb Excellence in Teaching Award</b><br/><i>The Webb Schools of California</i></p> <p><b>The Heinrich W. Brinkmann Mathematics Prize</b><br/><i>Swarthmore College</i></p> | <p><i>April 2022</i></p> <p><i>June 2018</i></p> <p><i>June 2015</i></p> <p><i>June 2012</i></p> |
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## FUNDING

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### Research Grants

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| <ul style="list-style-type: none"> <li>• <b>Academic Year Undergraduate Research Initiative</b> (\$1,000)<br/><i>Pepperdine University</i></li> <li>• <b>Collaborative Research Grant for Postdocs</b> (\$1,500)<br/><i>University of Arizona</i></li> </ul> | <p><i>Sept 2023</i></p> <p><i>June 2020</i></p> |
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### Travel Awards

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| <ul style="list-style-type: none"> <li>• <b>AIM SQuaRE Research Collaboration</b><br/><i>American Institute of Mathematics (AIM)</i></li> </ul> | <p><i>Jan 2024</i></p> |
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- **TDA-BIO** (\$1,000) Oct 2016  
ACM Conference on Bioinformatics, Computational Biology, and Health Informatics

## Fellowships

- **Clinic Fellowship** (\$900) Jan 2020  
University of California, Irvine
- **Daniel Pick Fellowship** (\$10,000) Oct 2017  
Claremont Graduate University
- **Joseph and Elizabeth Peeler Endowed Fellowship** (\$32,570) Aug 2015 – June 2017  
Claremont Graduate University
- **CGU Mathematics Fellowship** (\$13,700) Aug 2014 – June 2015, June 2017  
Claremont Graduate University
- **CGU Minority Fellowship** (\$2,000) Aug 2014 – June 2016  
Claremont Graduate University

## SKILLS

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### Programming Languages

- C (*Moderate proficiency*)
- C++ (*Moderate proficiency*)

- MATLAB (*Proficient*)
- Python (*Proficient*)
- R (*Proficient*)

### Scientific Applications

- GitHub
- LaTeX
- RSweave

### Languages

- English (*Native*)
- Spanish (*Reading, writing, and conversational speaking*)