

# CHRISTINA DURÓN

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## ACADEMIC EMPLOYMENT

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### Postdoctoral Research Associate

*Department of Mathematics, University of Arizona*

Aug 2019 – present

### High School Teacher

*Mathematics Department, The Webb Schools of California*

Aug 2013 – June 2019

## RESEARCH INTERESTS

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

## EDUCATION

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### 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\*

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5. Fider N, **Durón C**, Pfeffer D. From Mirrors to Wallpapers: A Virtual Math Circle Module on Symmetry. *Journal of Math Circles*. Accepted January 2022.
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). <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)
2. **Durón C**, Pan Y, Gutmann D.H., Hardin J, & Radunskaya A. (2019). 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)

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\* Authors are ordered by contribution.

## UNDER PEER REVIEW\*

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1. **Durón C**, Farrell A. A Mean-Field Approximation of SIR Epidemics on an Erdős-Rényi Network Model. *Bulletin of Mathematical Biology*. Submitted June 2021. Under revision September 2021.

## IN PREPARATION\*

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1. O'Brien E, **Durón C**. The Wasserstein Metric as a Tool for Assessing Burn-in of Markov Chains.

## RESEARCH POSITIONS

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### Graduate Research Assistant

*Pomona College*

*Jan 2017 – June 2018*

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

### Jet Propulsion Laboratory (JPL) Intern

*California Institute of Technology*

*June 2015 – August 2015*

- 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

*Arizona State University*

*June 2011 – July 2011*

- 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

*University of Arizona*

- **MATH 491: Undergraduate Teaching Assistantship (UTA) Seminar** *Fall 2021 – 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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### Contributed

3. **A Mean Field Approximation of SIR Epidemics on an Erdős-Rényi Network Model** May 2021  
*Los Alamos-Arizona Days Conference (Virtual Poster)*
2. **Identifying Super-Spreader Nodes in Scale-Free Networks using Network Centrality Measures** Sept 2020  
*Arizona Postdoctoral Research Conference (Virtual Talk)*
1. **Identifying Treatment Targets for Pediatric Gliomas using Network Centrality Measures** June 2020  
*SIAM Conference on the Life Sciences (Virtual Talk)*

### Seminar

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*

### Other

2. **The Distribution of Betweenness Centrality in Exponential Random Graph Models** April 2019  
*Claremont Graduate University, Doctoral Thesis Defense*
1. **A Mathematical Model of the Emission and Optimal Control of Photochemical Smog** Aug 2011  
*Arizona State University, Mathematical and Theoretical Biology Institute (MTBI)*

## DEVELOPMENT AS AN EDUCATOR

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### 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

## DEVELOPMENT AS A RESEARCHER

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### Workshops

- **Network Modeling for Epidemics** Aug 2020  
*University of South Florida*

- **BioBridge Clinic** Jan 2020  
*University of California, Irvine*
- **Computational Genomics Summer Institute** May 2019  
*University of California, Los Angeles*

## OUTREACH AND SERVICE

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### Mentoring and Advising

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

### Departmental Service

- **President, Postdoctoral Governance** Fall 2021 – present  
*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

- **Reviewer for:**
  - 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** June 2016 – June 2017  
Claremont Graduate University

## 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

• **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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**The Jean E. Miller Excellence in Teaching Award** June 2018  
The Webb Schools of California

**The Thompson and Vivian Webb Excellence in Teaching Award** June 2015  
The Webb Schools of California

**The Heinrich W. Brinkmann Mathematics Prize** June 2012  
Swarthmore College

## FUNDING

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### Research Grants

• **Collaborative Research Grant for Postdocs** (\$1,500) June 2020  
University of Arizona

### Travel Awards

• **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*)