

# Anna C. Nelson

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## CONTACT INFORMATION

Department of Mathematics  
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## RESEARCH INTERESTS

Dynamical systems, mathematical biology (polymerization, cell physiology), stochastic processes

## ACADEMIC APPOINTMENTS

**Duke University**, Durham, NC 2021 – present  
William W. Elliott Assistant Research Professor (postdoctoral position)  
Department of Mathematics  
Mentor: Maria-Veronica Ciocanel

## EDUCATION

**University of Utah**, Salt Lake City, UT May 2021  
Ph.D., Mathematics  
Advisor: Aaron Fogelson

**Boise State University**, Boise, ID December 2012  
B.S., Applied Mathematics, *Summa Cum Laude*  
Minor: Computer Science

## PUBLICATIONS & PREPRINTS

7. **A. C. Nelson**, M. M. Rolls, M. V. Ciocanel, and S. A. McKinley. “Minimal mechanisms of micro-tubule length regulation in living cells.” *Submitted*. arXiv:2310.13666.
6. A. Kent, K. Leiderman, **A. C. Nelson**, S. Sindi, M. M. Stadt, L. Xiong, and Y. Zhang. “Studying the effects of oral contraceptives on coagulation using a mathematical modeling approach.” *Submitted*.
5. **A. C. Nelson** and A. L. Fogelson. “Towards understanding the effect of fibrinogen interactions on fibrin gel structure.” *Physical Review E*, 107(2):024415, 2023.
4. A. L. Fogelson, **A. C. Nelson**, C. Zapata-Allegro, and J. P. Keener. “Development of fibrin branch structure before and after gelation.” *SIAM Journal on Applied Mathematics*, 82(1), 2022.
3. **A. C. Nelson**, M. A. Kelley, L. M. Haynes, and K. Leiderman. “Mathematical models of fibrin polymerization: past, present, and future.” *Current Opinion in Biomedical Engineering*, 20 (100350), 2021.
2. **A. C. Nelson**, J. P. Keener, and A. L. Fogelson. “Kinetic model of two-monomer polymerization”. *Physical Review E*, 101(2), 2020.
1. J. L. Herlin, **A. C. Nelson** and M. Scheepers. “Using ciliate operations to construct chromosome phylogenies”. *Involve*, 9(1), 2016.

## AWARDS

**Lewis Blake Award for Excellence in Teaching**, Mathematics, Duke University 2023  
Annual postdoctoral award given for excellence in teaching

**BioFire Scholar Award**, Mathematics, University of Utah 2020  
Annual award to one graduate student in department; includes stipend, tuition, and travel.

**AWM Student Chapter Award for Scientific Excellence** 2020  
One of four national awards given by the Association for Women in Mathematics while as Student Chapter Vice President.

## FUNDING

**Seed Grant**, Duke Office for Faculty Advancement February 2022 – March 2023  
\$14,000 award for Faculty-Student (FaSt) Math Series to build bridges and community among students and faculty in the mathematics department. Grant aims include organizing events and programs such as faculty student book clubs, student professional development panels, workshops on mentorship training for faculty, and invited speakers.

**University Teaching Assistantship**, Graduate College, University of Utah 2018 – 2019  
Co-awarded for the mathematics Graduate Teaching Mentorship (GTM) program.

**NSF Research Training Grant Fellowships**

DMS-2038056 (Training Tomorrow's Workforce in Analysis and Applications)	2021 – 2023
DMS-1148230 (Research Training in Mathematical and Computational Biology)	2014 – 2015

# Travel funding

Duke University Arts & Science Travel Fund	2023
\$1000 to attend JMM 2024 in San Francisco CA	
AWM/NSF Travel Award	2023
\$1500 to attend AWM Research Symposium in Atlanta GA	
AWM Travel Grant	2023
\$3500 to attend ICIAM 2023 in Tokyo, JP	
SIAM Early Career Travel Award	Spring 2023
\$650 to attend SIAM Dynamical Systems 2023 in Portland, OR	
MAA Project NExT Fellow	2021 – 2023
\$5000 to attend MAA Mathfest 2022 & 2023 and JMM 2023	
SIAM Student Travel Award	Spring, Summer 2020
\$650 to attend SIAM Annual 2020 & Life Sciences 2020 (cancelled due to COVID)	
University of Utah Graduate School Travel Award	Spring 2020
\$345 to attend JMM 2020 in Denver, CO	
University of Utah Mathematics Department Travel Award	Spring 2020
\$500 to attend JMM 2020 in Denver, CO	

# INVITED SEMINAR TALKS

<i>Mathematical Biology Seminar</i>	December 2023
University of Illinois Urbana-Champaign (virtual)	
<i>Biomath Seminar Series</i>	November 2023
NC State University, Raleigh NC	
<i>Mathematical Biology Seminar</i>	October 2023
University of Pennsylvania, Philadelphia PA	
<i>Mathematical Biology Seminar</i>	February 2023
Brandeis University (virtual)	
<i>Applied and Computational Mathematics Seminar</i>	November 2022
Tulane University, New Orleans, LA	
<i>Claremont Center for Mathematical Sciences Applied Math Seminar</i>	October 2022
Harvey Mudd College (virtual)	
<i>Mathematical Biology Seminar</i>	October 2021
University of California, Davis (virtual)	
<i>Mathematical Biology Seminar</i>	September 2021
Duke University, Durham NC	
<i>Mathematical Biology Seminar</i>	March 2021
Joint with University of British Columbia and University of Utah (virtual)	
<i>Boise State University Mathematics REU Program</i>	July 2019
Boise State University, Boise ID	

# INVITED & CONTRIBUTED CONFERENCE TALKS

<i>Modeling mechanisms of microtubule dynamics and polarity in neurons</i>	
Joint Mathematics Meeting, AWM Special Session	January 2024
MAA MathFest, Invited Paper Session	August 2023
SMB Annual Meeting, Invited Minisymposium	July 2023
SIAM Conference on Applications of Dynamical Systems, Contributed Session	May 2023
AMS Spring Central Sectional Meeting, Special Session	April 2023
Joint Mathematics Meeting, AMS Special Session	January 2023
<i>Towards a model of platelet aggregation and fibrin polymerization</i>	
Joint Mathematics Meeting, AMS Special Session	January 2024
AWM Research Symposium, Special Session	September 2023
AWM Research Symposium, Special Session	June 2022
<i>Understanding the effects of fibrinogen interactions on fibrin gel structure</i>	
SIAM Conference on the Life Sciences, Special Session	July 2022

	SMB Annual Meeting (virtual), Invited Minisymposium	June 2021
	SIAM Conference on the Life Sciences (virtual), Special Session	June 2020
	<i>A kinetic model of two-monomer polymerization</i>	
	Joint Mathematics Meeting, AMS-AWM Special Session	January 2020
	AMS Fall Western Sectional Meeting, Special Session	November 2019
<b>SELECT POSTER PRESENTATIONS</b>	Triangle Computational and Applied Mathematics Symposium, Durham NC*	November 2023
	AWM Research Symposium Poster Session, Minneapolis MN	June 2022
	AWM Graduate Student Poster Session at JMM (virtual)	January 2021
	AWM Graduate Student Workshop at SIAM Annual (virtual)	July 2020
	IMA Workshop for Women in Mathematical Biology, Minneapolis MN	May 2018
	Modeling Complex Fluids for Biological Applications, Salt Lake City UT	May 2017
	* – Postdoc poster award winner	
<b>MENTORSHIP</b>	<b>SPIRE Fellows Postdoctoral Assistant and Faculty Mentor</b>	2021 – present
	Assists in organizing and running academic support/mentoring system for high achieving undergraduates from historically excluded backgrounds. Responsibilities include organizing monthly events for fellows and teaching First Year Seminar course titled “Being Human and Flourishing in STEM,” which is a discussion-based course on identity and humanity in STEM.	
	<b>AWM Undergraduate Mentor</b>	
	Paired with undergraduate students to meet monthly to discuss semester, future plans, and build community.	
	University of Utah	2019 – 2021
	Duke University	2021 – present
	<b>Graduate Research</b>	
	Hannah Scanlon, Duke University	Spring 2022 – present
	<b>Undergraduate Research</b>	
	Carson Dudley (undergraduate thesis), Duke University	Spring 2022 – Spring 2023
	Maycol Vilchez, University of Utah (with Aaron Fogelson)	Spring 2020
<b>TEACHING EXPERIENCE</b>	<b>Undergraduate Directed Reading Program, University of Utah</b>	Spring 2019
	Chase Stolworthy, use machine learning for predictions on voting data in Utah	
	<b>Duke University</b>	
	MATH 353/753, Ordinary and Partial Differential Equations	Spring 2024
	BIO 218/MATH 183, Biological Clocks: How Organisms Keep Time	Fall 2023
	MATH 577, Mathematical Modeling <sup>†</sup>	Spring 2023
	MATH 75, Being Human in STEM for First Year SPIRE Fellows	Spring 2023
	BIO 218/MATH 183, Biological Clocks: How Organisms Keep Time	Fall 2022
	MATH 75, Being Human in STEM for First Year SPIRE Fellows	Spring 2022
	MATH 353/753, Ordinary and Partial Differential Equations	Spring 2022
	MATH 353/753, Ordinary and Partial Differential Equations	Fall 2021
	<b>University of Utah</b>	
	MATH 2250, Differential Equations and Linear Algebra	Spring 2019
	MATH 1030, Intro to Quantitative Reasoning <sup>‡</sup>	Summer 2018
	MATH 1220, Calculus II	Spring 2018
	MATH 1100, Business Calculus	Fall 2017
	MATH 1050, College Algebra <sup>‡</sup>	Summer 2017
	MATH 1050, College Algebra	Spring 2017
	MATH 1050, College Algebra	Fall 2016
	MATH 1030, Intro to Quantitative Reasoning <sup>‡</sup>	Summer 2016
	MATH 1030, Intro to Quantitative Reasoning	Spring 2016
	<sup>†</sup> – Graduate level course, <sup>‡</sup> – Asynchronous online course	
	<b>Project NExT Fellowship</b>	2021 – 2023
	Professional development program for early career mathematicians directed towards improving	

the teaching and learning of mathematics, fostering inclusivity in the mathematics community, and providing early career faculty strategies to engage in research, scholarship, and service opportunities.

**Mathematics Instructor Training Facilitator**, University of Utah 2017, 2018, 2019  
Facilitated annual workshop for new teaching assistants in the mathematics department. Responsibilities include organizing/planning workshops, observing new teachers, and giving lectures on teaching pedagogy.

## SERVICE & OUTREACH

### Service to the profession:

- Co-organizer*, Minisymposium for AWM Research Symposium September 2023  
"Promoting children's and women's health with mathematical and computational approaches"  
Clark Atlanta University, Atlanta GA
- Co-organizer*, Minisymposium for 10th ICIAM August 2023  
"Recent Advances in Modeling Complex Systems and Multiscale Problems in Mathematical Biology"  
Waseda University, Tokyo JP
- Judge*, MAA MathFest Student Poster Session, Tampa FL August 2023
- Co-organizer*, Invited Paper Session for MAA MathFest August 2023  
"Recent Advances in Mathematical and Computational Biology, Highlighting Contributions from Undergraduate Researchers."  
Tampa FL
- Assistant*, AMS Mathematical Research Communities Week 3 June 2023  
"Complex Social Systems"  
Beaver Hollow Conference Center, Java Center NY
- Judge*, SIAM Dynamical Systems Red Sock Poster Session, Portland OR May 2023
- Judge*, MAA MathFest Student Poster Session, Philadelphia PA August 2022
- Co-organizer*, Minisymposium for SIAM Life Sciences July 2022  
"Mathematical Modeling of Blood Clotting and its Application"  
Pittsburgh PA
- Co-organizer*, Minisymposium at SMB Annual Meeting June 2021  
"Mathematical Modeling of Blood Clotting: From Surface-Mediated Coagulation to Fibrin Polymerization"  
Virtual
- Judge*, JMM Student Poster Session, Denver CO January 2020
- Presenter*, Center for Science and Mathematics Education Exchange November 2018  
"Teacher Training & Community Building:  
From Graduate Student to Colleague" (joint with Kelly MacArthur, Rebecca Terry)  
University of Utah, Salt Lake City UT
- Panelist*, Utah Math TA Training August 2016  
"Experienced graduate student panel"  
University of Utah, Salt Lake City UT
- Panelist*, Idaho Conference on Undergraduate Research July 2014  
"Applying to grad school"  
Boise State University, Boise ID

### Service to the university and department:

- Presenter*  
Grad-Fac Seminar, Department of Mathematics, Duke University October 2023  
"The mathematics of bell-ringing"
- Grad-Fac Seminar, Department of Mathematics, Duke University January 2023  
"Mathematical modeling of polymerization processes in physiology"
- SPIRE Speaker Series, Duke University August 2021  
"Who can do math?"
- Math Graduate Student Colloquium, University of Utah October 2020  
"Computing in the Natural World: *In vivo* and *in vitro*"

Math Graduate Student Colloquium, University of Utah "The mathematics of bell-ringing"	February 2020
Undergraduate Math Colloquium, University of Utah "On the rheology of cats: Are cats fluids?"	April 2018
Math Graduate Student Colloquium, University of Utah "On the rheology of cats: Are cats fluids?"	November 2017
Math Graduate Student Colloquium, University of Utah "Computing in the Natural World: <i>In vivo</i> and <i>in vitro</i> "	September 2015
Co-organizer, Panel on Math Graduate School Admissions, FaSt Grant Department of Mathematics, Duke University	November 2022
Co-organizer, Faculty-Student Weekly Tea, FaSt Grant Department of Mathematics, Duke University	February 2022 – present
Co-organizer, Faculty-Student Math Book Club Department of Mathematics, Duke University	February 2022 – May 2023
Organizer, Biofluids research seminar Organization of weekly research seminar for faculty, graduate students and postdocs Department of Mathematics, University of Utah	2020 – 2021
Co-chair, AWM Speaker series committee Invite and host mathematicians from underrepresented groups to give talks and socialize with department. Department of Mathematics, University of Utah	2020 – 2021
Professional Development Committee, Graduate Student Advisory Committee Organize monthly professional development events for grad students/postdocs Department of Mathematics, University of Utah	2018 – 2021
Recruitment Committee, Graduate Student Advisory Committee Coordinate prospective graduate student recruitment activities and schedule. Department of Mathematics, University of Utah	2016 – 2017
Panelist, Utah Math TA Training "Experienced graduate student panel" Department of Mathematics, University of Utah	August 2016

**Service to promote diversity, equity, and inclusivity:**

Committee member, Diversity, Equity, and Inclusion Team	August 2022 – present
Panelist, GROW (Graduate Research Opportunities for Women) "From day 1 to PhD" Duke University, Durham NC Department of Mathematics, Duke University	October 2022
Student mentor, AWM Student Chapter Department of Mathematics, Duke University Department of Mathematics, University of Utah	2021 – 2022
Panelist, Society for Women in Mathematics (SWiM) "Graduate school panel" Department of Mathematics, Colorado School of Mines (virtual)	October 2020
Vice President, AWM Student Chapter Organize monthly student events for undergraduates and graduate students, organize outreach events on and off campus, and meet with job candidates. Department of Mathematics, University of Utah	2019 – 2020

**COMMUNITY  
OUTREACH**

Volunteer, Duke Math Circles with Durham Children's Initiative Provide exploratory instruction for K-6 students Durham NC	August 2022 – present
Presenter, Girls Exploring Math, Duke University "Math: We $R_0$ afraid to use it!" Durham NC	June 2023
Volunteer, Defining Your Path – Field Trip Program University of Utah, Salt Lake City UT	February 2020
Judge, State of Utah Sterling Scholar Award, Mathematics Salt Lake City UT	January 2020

<b>Panelist</b> , Clayton Middle School – Career Fair Salt Lake City UT	January 2020
<b>Presenter</b> , Science Day at the U., University of Utah “Computing in Nature: Using DNA to solve math problems” University of Utah, Salt Lake City UT	November 2019
<b>Presenter</b> , Girls Full STEAM Ahead Camp “Math: We $R_0$ afraid to use it!” Leonardo Museum, Salt Lake City UT	July 2016

**WORK  
EXPERIENCE**

<b>Bioinformatics Summer Intern</b> Sera Prognostics, Salt Lake City, UT Developed R scripts to remove batch and technical effects in proteomic data to aid in preterm birth prediction.	May 2019 – August 2019
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**MEMBERSHIPS**

American Mathematical Society  
Association for Women in Mathematics  
Mathematical Association of America  
Society for Industrial and Applied Mathematics  
Society of Mathematical Biology