Anna C. Nelson

CONTACT INFORMATION	Department of Mathematics Duke University Physics 210, 120 Science Drive, Box 90320 Durham, NC 27708	Email: anelson@math.duke.edu Website: http://annacnelson.github.io

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. Rolls, M. V. Ciocanel, and S. A. McKinley. "Minimal mechanisms of microtubule length regulation in living cells." 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 Funding — 2023
$1500 to attend AWM Research Symposium in Atlanta GA

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

INVITED & CONTRIBUTED CONFERENCE TALKS

Modeling mechanisms of microtubule dynamics and polarity in neurons

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

Towards a model of platelet aggregation and fibrin polymerization

Joint Mathematics Meeting, AMS Special Session	January 2024
AWM Research Symposium, Special Session	September 2023
AWM Research Symposium, Special Session	June 2022

Understanding the effects of fibrinogen interactions on fibrin gel structure

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

A kinetic model of two-monomer polymerization
Joint Mathematics Meeting, AMS-AWM Special Session	January 2020
AMS Fall Western Sectional Meeting, Special Session	November 2019

SELECT POSTER PRESENTATIONS

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

⋆ – Poster award winner

MENTORSHIP

SPIRE Fellows Postdoctoral Assistant and Faculty Mentor   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.

AWM Undergraduate Mentor
Paired with undergraduate students to meet monthly to discuss semester, future plans, and build community.
University of Utah	2019 – 2021
Duke University	2021 – present

Graduate Research
Hannah Scanlon, Duke University	Spring 2022 – present

Undergraduate Research
Carson Dudley (undergraduate thesis), Duke University	Spring 2022 – Spring 2023
Maycol Vilchez, University of Utah (with Aaron Fogelson)	Spring 2020

Undergraduate Directed Reading Program, University of Utah   Spring 2019
Chase Stolworthy, use machine learning for predictions on voting data in Utah

TEACHING EXPERIENCE

Duke University
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†	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

University of Utah
MATH 2250, Differential Equations and Linear Algebra	Spring 2019
MATH 1030, Intro to Quantitative Reasoning‡	Summer 2018
MATH 1220, Calculus II	Spring 2018
MATH 1100, Business Calculus	Fall 2017
MATH 1050, College Algebra‡	Summer 2017
MATH 1050, College Algebra	Spring 2017
MATH 1050, College Algebra	Fall 2016
MATH 1030, Intro to Quantitative Reasoning‡	Summer 2016
MATH 1030, Intro to Quantitative Reasoning	Spring 2016

† – Graduate level course, ‡ – Asynchronous online course

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

Service to promote diversity, equity, and inclusivity:

Committee member, Diversity, Equity, and Inclusion Team	August 2022 – present
Panelist, GROW (Graduate Research Opportunities for Women)	October 2022
"From day 1 to PhD"	
Duke University, Durham NC Department of Mathematics, Duke University	
Student mentor, AWM Student Chapter	2021 – 2022
Department of Mathematics, Duke University Department of Mathematics, University of Utah	
Panelist, Society for Women in Mathematics (SWiM)	October 2020
"Graduate school panel"	
Department of Mathematics, Colorado School of Mines (virtual)	
Vice President, AWM Student Chapter	2019 – 2020
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	

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

Panelist, Clayton Middle School – Career Fair   January 2020
     Salt Lake City UT

Presenter, Science Day at the U., University of Utah   November 2019
     "Computing in Nature: Using DNA to solve math problems"
     University of Utah, Salt Lake City UT

Presenter, Girls Full STEAM Ahead Camp   July 2016
     "Math: We R_0 afraid to use it!"
     Leonardo Museum, Salt Lake City UT

WORK **EXPERIENCE**	**Bioinformatics Summer Intern** Sera Prognostics, Salt Lake City, UT	May 2019 – August 2019

     Developed R scripts to remove batch and technical effects in proteomic data to aid in preterm
     birth prediction.

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