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

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.

GRANTS

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.

AWARDS

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

NSF Research Training Grant Fellowships
DMS-2038056 — 2021 – 2023
DMS-1148230 — 2014 – 2015

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.

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

Travel awards

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

Biomath Seminar Series November 2023
NC State University, Raleigh NC

Mathematical Biology Seminar October 2023
University of Pennsylania, Philadelphia PA

Mathematical Biology Seminar February 2023
Brandeis University (virtual)

Applied and Computational Mathematics Seminar November 2022
Tulane University, New Orleans, LA

Claremont Center for Mathematical Sciences Applied Math Seminar October 2022
Harvey Mudd College (virtual)

Mathematical Biology Seminar October 2021
University of California, Davis (virtual)

Mathematical Biology Seminar September 2021
Duke University, Durham NC

Mathematical Biology Seminar March 2021
Joint with University of British Columbia and University of Utah (virtual)

Boise State University Mathematics REU Program July 2019
Boise State University, Boise ID

INVITED & CONTRIBUTED CONFERENCE TALKS

Joint Mathematics Meeting, San Francisco, CA January 2024
AWM Special Session on Women in Mathematical Biology

Joint Mathematics Meeting, San Francisco, CA January 2024
AMS Special Session on Dynamical Systems Modeling for Biological and Social Systems

AWM Research Symposium, Clark Atlanta University, Atlanta, GA September 2023
Early Career Researchers in Mathematical Biology and Differential Equations

MAA MathFest, Tampa, FL August 2023
Invited Paper Session on Frontiers in Differential Equations and Applications

SMB Annual Meeting, The Ohio State University, Columbus OH July 2023
Data-driven, modeling, and topological techniques in cell and developmental biology

SIAM Conference on Applications of Dynamical Systems, Portland OR May 2023

AMS Spring Central Sectional Meeting, University of Cincinnati, Cincinnati OH April 2023
Special Session on Mathematical Modeling in Biosciences

Joint Mathematics Meeting, Boston MA January 2023
AMS Special Session on Modeling Collective Behavior in Biology

Southeastern-Atlantic Regional Conference on Differential Equations November 2022
NC State University, Raleigh NC

SIAM Conference on the Life Sciences, Pittsburgh PA — July 2022
Mathematical Modeling of Blood Clotting and its Application Minisymposium

AWM Research Symposium, University of Minnesota, Minneapolis MN — June 2022
Recent Advances in Mathematical Biology Special Session

SMB Annual Meeting (virtual) — June 2021
Mathematical Modeling of Blood Clotting: From Surface-Mediated Coagulation to Fibrin Polymerization Minisymposium

SIAM Conference on the Life Sciences (virtual) — June 2020
Mathematical and Computational Modeling of Blood Clotting Minisymposium

Joint Mathematics Meeting, Denver CO — January 2020
AMS-AWM Special Session on Women in Mathematical Biology

AMS Fall Western Sectional Meeting, UC Riverside, Riverside CA — November 2019
Special Session on Mathematical Modeling in Developmental Biology

WORKSHOPS & SHORT COURSES

Complex Social Systems — June 2023
Topological data analysis and resource coverage, opinion dynamics and disease spread
AMS Mathematical Research Communities, Java Center NY

Sex differences in physiology: Mathematical modelling and analysis — March 2023
Invited participant
Banff International Research Station, Banff AB

Collaborative Workshop for Women in Mathematical Biology: — June 2022
Mathematical Approaches to Support Women's Health
Invited participant, project co-lead
Institute for Mathematics and its Applications, Minnetonka MN

Workshop for Women in Mathematical Biology — May 2018
Institute for Mathematics and its Applications, Minneapolis MN

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

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

Undergraduate Research
Carson Dudley, 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 577, Mathematical Modeling (graduate course)	Spring 2023
BIOLOGY 218, Biological Clocks: How Organisms Keep Time	Fall 2022, Fall 2023
MATH 75, Being Human in STEM for First Year SPIRE Fellows	Spring 2022, Spring 2023
MATH 353/753, Ordinary and Partial Differential Equations	Fall 2021, Spring 2022

University of Utah

MATH 2250, Differential Equations and Linear Algebra	Spring 2019
MATH 1030, Intro to Quantitative Reasoning (online)	Summer 2018
MATH 1220, Calculus II	Spring 2018
MATH 1100, Business Calculus	Fall 2017
MATH 1050, College Algebra	Fall 2016, Spring 2017, Summer 2017 (online)
MATH 1030, Intro to Quantitative Reasoning	Spring 2016, Summer 2016 (online)

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 — January 2023
"Mathematical modeling of polymerization processes in physiology"
Department of Mathematics, Duke University

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

Presenter, SPIRE Speaker Series — August 2021
"Who can do math?"
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

Presenter, Graduate Student Colloquium — February 2020
"The mathematics of bell-ringing"
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

Presenter, Undergraduate Math Colloquium — April 2018
"On the rheology of cats: Are cats fluids?"
Department of Mathematics, University of Utah

Presenter, Graduate Student Colloquium — November 2017
"On the rheology of cats: Are cats fluids?"
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

Presenter, Graduate Student Colloquium — September 2015
"Computing in the Natural World: *In vivo* and *in vitro*"
Department of Mathematics, University of Utah

Service to promote diversity, equity, and inclusivity:

Panelist, GROW (Graduate Research Opportunities for Women) — October 2022
"From day 1 to PhD"
Duke University, Durham NC

Committee member, Diversity, Equity, and Inclusion Team — August 2022 – present
Department of Mathematics, Duke University

Student mentor, AWM Student Chapter 2021 – 2022
Department of Mathematics, Duke University

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

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 May 2019 – August 2019
Sera Prognostics, Salt Lake City, UT
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