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.

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

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

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

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 (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 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 week-long 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

Poster Session Judge
  MAA MathFest   August 2023
  SIAM Dynamical Systems   May 2023
  MAA MathFest   August 2022
  JMM Student Poster Session   January 2020

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

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

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 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 out-
    reach 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	

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	

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