Anna C. Nelson

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RESEARCH INTERESTS	Mathematical biology, dynamical systems, polymerization, cell physiology, applied mathematics

ACADEMIC POSITIONS

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

EDUCATION

University of Utah, Salt Lake City, UT   2021
Ph.D., Mathematics
Advisor: Aaron Fogelson
Dissertation: Kinetic polymerization models and the roles of fibrinogen
in fibrin gel formation

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

PUBLICATIONS

A. C. Nelson and A. L. Fogelson. "Understanding the effect of fibrin interactions on fibrin gel structure." *Submitted.*

A. L. Fogelson, **A. C. Nelson**, C. Zapata-Allegro, and J. P. Keener. "Development of fibrin branch structure before and after gelation." *Submitted.*

A. C. Nelson, M. A. Kelley, L. M. Haynes, and K. Leiderman. "Using Mathematical Modeling to Understand the Fibrin Polymerization Trifecta: Fibrin(ogen), Thrombin, and FXIII." *Submitted to Current Opinion in Biomedical Engineering.*

A. C. Nelson, J. P. Keener, and A. L. Fogelson. "Kinetic model of two-monomer polymerization". *Physical Review E*, 101, 022501, (2020). https://link.aps.org/doi/10.1103/PhysRevE.101.022501

J. L. Herlin, **A. C. Nelson** and M. Scheepers. "Using ciliate operations to construct chromosome phylogenies". *Involve*, Vol. 9 (2016), No. 1. http://dx.doi.org/10.2140/involve.2016.9.1

AWARDS

BioFire Scholar Award   Spring, Summer 2020
- Annual award to one graduate student in department; includes stipend, tuition, and travel

University of Utah University Teaching Assistantship   2018 – 2019
- Awarded by Graduate School, one of 16 proposals funded.
- Co-mentor for the Graduate Teaching Mentorship (GTM) program.
- Proposal: Establish GTM program to mentor new graduate student instructors.

NSF Research Training Grant Fellowship RTG-1148230   2014 – 2015
- Approximately five RTG awards are offered in an academic year.

RTG Summer Lab Rotation, Genetics Laboratory. (PI: Gillian Stanfield)   2015
- Approximately five lab rotation awards are offered in an academic year.

Travel awards
- University of Utah Graduate School Travel Award   Spring 2020
- SIAM Student Travel Award   Spring, Summer 2020
- Mathematics Department Travel Award   Spring 2020

TECHNICAL SKILLS

Languages & Software: (Most to least proficient) MATLAB, Python, R, TensorFlow, Java, C, SAS
Others: LaTeX, CSS, HTML, Linux

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.
- Collaborated with Bioinformatics and R&D team, attended weekly R&D meetings.
- Presented results biweekly and designed new directions for project.

SELECTED TALKS & POSTERS

Kinetic polymerization models and the roles of fibrinogen in fibrin gel formation   September 2021
Duke University, Math Biology Seminar
Invited Talk

Kinetic polymerization models and the roles of fibrinogen in fibrin gel formation   March 2021
University of Utah & University of British Columbia, Math Biology Seminar
Virtual Invited Talk

Understanding the effect of fibrinogen interactions on fibrin gel time and structure   January 2021
Joint Mathematics Meeting 2021 (part of AWM Graduate Student Poster Session)
Virtual Conference

Modeling fibrin gel formation with fibrinogen interactions (poster)   July 2020
SIAM Annual 2020 (part of AWM Graduate Student Workshop)
Virtual Conference

Modeling fibrin gel formation with fibrinogen interactions   June 2020
SIAM Life Sciences 2020 (invited minisymposium talk)
Virtual Conference

Understanding the role of fibrinogen in fibrin gelation: Kinetic models of   January 2020
two monomer polymerization.
Joint Mathematics Meeting (invited special session talk)
Denver, CO

Understanding the role of fibrinogen in fibrin gelation: Kinetic models of   November 2019
two monomer polymerization.
AMS Western Regional Conference
Riverside, CA

Understanding the role of fibrinogen in fibrin gelation: Modeling two   July 2019
monomer polymerization
Boise State University Mathematics REU Program (invited talk)
Boise, ID

A kinetic model for two monomer polymerization with conversion (poster)   May 2018
IMA Workshop for Women in Mathematical Biology (funded participant)
Minneapolis, MN

A kinetic model for two monomer polymerization (poster)   May 2017
Modeling Complex Fluids and Gels for Biological Applications Conference
Salt Lake City, UT

WORKSHOPS &	*American Mathematical Society Short Course (virtual)*	January 2021
SHORT COURSES	Mathematical and Computational Methods for Complex Social Systems	

Institute for Mathematics and its Applications Special Workshop (funded participant)   May 2018
Workshop for Women in Mathematical Biology, Minneapolis, MN

MENTORSHIP   **Mentor for Undergraduate Research**   Spring 2020
University of Utah, Salt Lake City, UT
- Mentor to undergraduate student Maycol Vilchez with Aaron Fogelson for undergraduate special projects course (MATH 5960). Project: Incorporating coagulation to an existing fibrin polymerization model.
- Aided in project development and code development, held weekly meetings.

Mentor for Undergraduate Directed Reading Program   Spring 2019
University of Utah, Salt Lake City, UT
- Mentor undergraduate student through independent reading course on machine learning, which included prediction project on voting data in Utah.
- Responsibilities include organizing/planning materials/problems for undergraduate student, answering questions on material. Prepared and aided in end-of-semester student presentation.

AWM Undergraduate Mentor   2019 - present
University of Utah, Salt Lake City, UT
- Paired with undergraduate student throughout year to meet monthly to discuss semester, future plans, graduate school decisions.

TEACHING   **Instructor of record** (full responsibility for syllabi, lectures, exams, and grades)
- Math 353: Elementary Differential Equations and Boundary Value Problems [Fall 2021, Duke]
- Math 2250: Differential Equations and Linear Algebra [Spring 2019, U. of Utah]
- Math 1220: Calculus II [Spring 2018, U. of Utah]
- Math 1100: Business Calculus [Fall 2017, U. of Utah]
- Math 1050: College Algebra [Fall 2016, Spring 2017, Summer 2017 (online), U. of Utah]
- Math 1030: Intro to Quantitative Reasoning [Spring 2016, Summer 2016 (online), Summer 2018 (online), U. of Utah]

Mathematics Instructor Training Workshop Facilitator   2017, 2018, 2019
University of Utah, Salt Lake City, UT
- 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 &   **Association for Women in Mathematics**   2017 − present
OUTREACH   University of Utah, Salt Lake City, UT
- Leadship roles: Speaker Series co-chair: 2020 - present, Vice President: 2019 - 2020
- *Awarded 2020 AWM Student Chapter Award for Scientific Excellence*
  - One of four national awards given by the Association for Women in Mathematics
  - Awarded for AWM Speaker Series & BRIDGES conference while in Vice President role
- Organize a Speaker Series each semester, invite mathematicians from underrepresented groups to give talks and socialize with department.
- Organize monthly student events for undergraduates and graduate students.
- Host panels for both undergraduate and graduate students, organize outreach events on and off campus.
- Meet with job candidates.

Graduate Student Advisory Committee, active member   2014 − present
University of Utah, Salt Lake City, UT
- *Recruitment committee*   2016 − 2017
  Coordinate prospective graduate student recruitment activities
  and recruitment schedule.

- *Professional Development committee*   2018 – present
  Organize monthly professional development events for grad students/postdocs, including resume/cover letter workshops, job material preparation, and industry job panel.

Biofluids Research Seminar and Biofluids Journal Club, Organizer   2020 – present
University of Utah, UT
- Organization of weekly research seminar for graduate students and postdocs, and organization of weekly journal club for faculty, graduate students, and postodcs.

Mathematics Category Judge, Sterling Scholar Award   2020
Salt Lake City, UT
- Evaluated and interviewed Utah high school students who were nominated by school administrators for this state scholarship.

Panel Participant
- Society for Women in Mathematics, Colorado School of Mines, virtual   October 2020
  Graduate school panel
- Department of Mathematics TA Training, University of Utah, Salt Lake City, UT   August 2016
  Experienced graduate student panel
- Idaho Conference on Undergraduate Research, Boise State University, Boise, ID   July 2014
  How to apply to graduate school

K-12 Outreach
- Middle school precalculus virtual homework help   Fall 2020
- 8th graders, Defining Your Path - Field Trip Program, University of Utah   February 2020
- Clayton Middle School - Career Fair, Salt Lake City UT   January 2020

OUTREACH TALKS

Computing in the Natural World   October 2020
Graduate Student Colloquium, University of Utah
Virtual

The mathematics of bell-ringing   February 2020
Graduate Student Colloquium, University of Utah
Salt Lake City, UT

Computing in Nature: Using DNA to solve math problems   November 2019
High School Science Day 2019, University of Utah
Salt Lake City, UT

Teacher Training & Community Building: From Graduate Student to Colleague   November 2018
with Kelly MacArthur and Rebecca Terry
Center for Science and Mathematics Education Exchange
Salt Lake City, UT

On the rheology of cats: Are cats fluids?   April 2018
Undergraduate Colloquium, University of Utah
Salt Lake City, UT

On the rheology of cats: Are cats fluids?   November 2017
Graduate Student Colloquium, University of Utah
Salt Lake City, UT

A kinetic model of two monomer copolymerization (poster)   October 2017
2017 National SACNAS Conference, University of Utah
Salt Lake City, UT

Math - We R_0 afraid to use it!   July 2016
Girls Full STEAM Ahead Camp, Leonardo Museum

Salt Lake City, UT

Computing in the Natural World: In vivo and in vitro   September 2015
Graduate Student Colloquium, University of Utah
Salt Lake City, UT