Elisa Bellah

Contact Information

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Employment

2022 - **Carnegie Mellon University**, Pittsburgh, PA
Postdoctoral Teaching Fellow

Education

2015 - 2022 **University of Oregon**, Eugene, OR
Ph.D. in Mathematics, June 2022
Thesis: *Linear Recurrence Sequences in Diophantine Analysis*
Thesis Advisor: Dr. Shabnam Akhtari

2011 - 2015 **Portland State University**, Portland, OR
B.S. in Mathematics, June 2015

Research Interests

Number theory, including Diophantine analysis, recurrence sequences, and explicit algebraic number theory.

Papers and Preprints

Research (* indicates undergraduate coauthor):

5.* Bounding Lifts of Markoff Triples mod p, with Elena Fuchs, Siran Chen, and Lynnelle Ye. Preprint available at arXiv:2311.11468.

4.* Arbitrary Finite Intersections of Doubling Measures and Applications, with Theresa C. Anderson, Zoe Markman, Teresa Pollard, and Josh Zeitlin. Submitted. Preprint available at arXiv:2310.17615.

3. Norm Form Equations and Linear Divisibility Sequences. **International Journal of Number Theory**. Vol. 18 (2021), No. 6. Preprint available at arXiv:2007.07392.

2. A Probabilistic Heuristic for Counting Components of Functional Graphs of Polynomials over Finite Fields, with Derek Garton, Erin Tannenbaum, and Noah Walton. **Involve**. Vol. 11 (2018), No. 1, 169-179. Preprint available at arXiv:1609.07667

Other Writing:

1. University of Oregon AWM Chapter: Its Creation and Evolution. With Sarah Frei, Leanne Merrill, and Kelly Pohland. Book chapter in: Beery, J.L., Greenwald, S.J., Kessel, C. (eds) Fifty Years of Women in Mathematics. Association for Women in Mathematics Series, vol 28. Springer, Cham.

Teaching Experience

Instructor of record for the following courses at Carnegie Mellon University:

Matrices and Linear Transformations	Spring 2023, Spring 2024
Number Theory	Fall 2022, Fall 2023
Differential and Integral Calculus	Fall 2022

Instructor of record for the following courses at the University of Oregon:

Introduction to Proof	Summer 2019, Summer 2021
Calculus III	Fall 2019, Winter 2020
Calculus I	Winter 2018, Spring 2018
Elementary Functions	Winter 2017, Fall 2017, Summer 2018, Fall 2018
College Algebra	Fall 2015, Winter 2016, Spring 2016, Summer 2016, Fall 2016, Summer 2017

Teaching assistant for the following courses at the University of Oregon:

Fundamentals of Number Theory II	Spring 2021
Introduction to Abstract Algebra I - III	Fall 2020 - Spring 2021
Fundamentals of Abstract Algebra I - II	Fall 2020 - Winter 2021
Calculus for Business II	Spring 2017

Additional Positions at Carnegie Mellon University:

SAMS Math Instructor: Number Theory and Cryptography. Residential merit-based precollege program for high school students from underrepresented communities interested in STEM. Sole instructor in Summer 2023. Co-taught with Dr. Anisah Nu'Man in Summer 2022.

CS Scholars: Implementation of Classical Cryptosystems. Residential merit-based pre-college program for high school students interested in computer science. Co-advised project with Dr. Anisah Nu'Man in Summer 2022.

Additional Positions at the University of Oregon:

Invited Course Assistant: Arizona Winter Semester 2021. Lecture series for undergraduate and beginning graduate students on quadratic forms and the local global-principal led by Dr. Charlotte Chan. Assisted 2021.

Program Development: Undergraduate Math Tutor and Grader Training. Developed and implemented training program for undergraduate math tutors. Consulted with department about best practices for undergraduate graders. Position held Winter 2019.

Undergraduate Mentoring Experience

Research projects advised through SUAMI at Carnegie Mellon University:

2024 **Markoff Triples and Periods of Linear Recurrence Sequences**. Project to be advised in Summer 2024.

2023 **Doubling Measures Along Sets of Natural Numbers** (3 students). Co-advised with Dr. Theresa C. Anderson . Project culminated in research paper. Students accepted to present at YMC and JMM in 2024.

Research projects advised through SURF at Carnegie Mellon University:

2023 **Bounding Lifts of Markoff Triples** (1 student). Project culminated in research paper. Student invited to give special session talk at JMM in 2024.

Reading projects mentored through the Directed Reading Program at the University of Oregon:

2021 **Geometry of Numbers and Applications** (2 students). Read chapters of J.W.S. Cassels *An Introduction to the Geometry of Numbers*. Students will each give 20 minute expository talks.

2020 **An Introduction to Algebraic Number Theory** (2 students). Read chapters of Paul Pollack's *A Conversational Introduction to Algebraic Number Theory: Arithmetic Beyond* $\mathbb{Z}$. Students each gave 20 minute expository talks.

2019 **Pell's Equation** (2 students). Read chapters of Edward J. Barbeau's *Pell's Equation (Problem Books in Mathematics)*. Students each gave 20 minute expository talks.

2018 **p-adic Numbers** (1 student). Read chapters of Fernando Gouvea's *p-adic Numbers: An Introduction*. Student gave 20 minute expository talk.

2017 **Constructible Numbers** (1 student). Read chapters of Ian Stewart's *Galois Theory*. Student presented a poster.

Awards, Fellowships, and Research Visits

2023 Provost's Inclusive Teaching Fellowship

2020 Anderson Distinguished Graduate Teaching Award

2019 Guest Researcher at the Max Planck Institute for Mathematics, Bonn, Germany

Talks and Presentations

Invited

2022 AWM Research Symposium, University of Minnesota

2022 Pitt AWM Student Seminar Series, University of Pittsburgh

2020 Algebraic Geometry and Number Theory Seminar, Rice University

2019 Number Theory Seminar, Oregon State University

2019 Combinatorics and Number Theory Seminar, Portland State University

2019 PLeaSANT Seminar, Max Planck Institute for Mathematics

Contributed

2020 Junior Mathematician Research Archive, Prerecorded talk (link to video)

2020 Conference on Fibonacci Numbers and Their Applications, University of Sarajevo (online)

2020 CTNT 2020 Conference, University of Connecticut (online)

2020 Number Theory Online Conference, University of Newcastle (online)

2020 Front Range Number Theory Day Lightning Talk, University of Colorado Boulder (online)

2020 Oregon Number Theory Day, Oregon State University (poster)

Service and Memberships

2023-2024 Co-director of SUAMI at CMU

2023-2024 Search committee member for CMU postdoctoral teaching fellow

2023 External reviewer for Archiv der Mathematik

2022-2023 Co-founder and organizer for the CMU Teaching in Practice Seminar

2020 - 2022 Co-founder and organizer for the Junior Mathematician Research Archive

2020 - 2022 Co-founder and organizer for the UO Committee for Learning about Antiracism in STEM

2019 - 2021 Organizer for the UO Student Number Theory Seminar

2018 - 2022 Co-founder and organizer for the UO Directed Reading Program

2019 External Reviewer for Finite Fields and their Applications

2019 - 2020	Mentor to first year graduate student
2019 - 2020	Co-organizer for the UO Number Theory Seminar
2018 - 2019	Graduate student representatiive for the UO Math Diversity and Equity Committee
2017 - 2018	President of the UO Chapter of the Association for Women in Mathematics