

Alison “AJ” Bu

ab1854@math.rutgers.edu | ajbu1.github.io

EDUCATION

Rutgers, The State University of New Jersey

PhD Student in Mathematics

Concentration: Experimental Mathematics

Advisor: Doron Zeilberger

September 2018-Present

New Brunswick, NJ

Boston College, Morrissey College of Arts and Sciences

Bachelor of Arts- Mathematics; Philosophy minor; magna cum laude

GPA: 3.77/4.00; Major GPA: 3.75

May 2017

Chestnut Hill, MA

TEACHING EXPERIENCE

Rutgers, The State University of New Jersey

Instructor of Record

Summer 2022, Summer 2023

New Brunswick, NJ

- Instructor of Record for Calculus II
- Created a lecture schedule and lesson plans, ran lectures, and facilitated group learning
- Wrote worksheets, quizzes, workshops, and exams
- Graded quizzes, workshops, and exams

Rutgers, The State University of New Jersey

Teaching Assistant

Fall 2019-Spring 2020, Fall 2021, Fall 2022

New Brunswick, NJ

- Teaching assistant for Calculus I (Fall 2019, Fall 2021), Calculus II (Spring 2020), and Linear Algebra (Fall 2022)
- Ran recitations or workshops –created lesson plans, reviewed material covered during lecture, and facilitated group learning
- Created worksheets and quizzes
- Graded workshops, quizzes, and exams

Newark Academy

Summer Session Teacher (June-August) and Substitute Teacher (January-August)

January-August 2018

Livingston, NJ

- Taught Algebra I during the summer session and created individualized lesson plans
- Planned and taught lessons as a per diem and long-term substitute
- Substituted regular and honors level math courses: (6th grade, Pre-Algebra, Algebra I, Geometry, Algebra II/Trig, precalculus, AB/BC Calculus, IB Math)
- Graded tests

Self-Employed Tutor

- Tutor for algebra, geometry, precalculus, calculus, the SAT, and the ACT

August 2017-August 2019

Brighton High School

Student Teacher

Spring 2015

Brighton, MA

- Completed placement in urban school for one full school day per week
- Planned and taught lessons in Physics (Special Education) and Advanced Algebra classes
- Created handouts and worksheets to aid student learning and assess student understanding

The Winston School

Full-Time Classroom Intern

May-June 2013

Short Hills, NJ

- Assisted in classes grades 3-8 for students with language-based learning disabilities
- Taught students in grades 3-8 one-on-one in math, English, science

RESEARCH EXPERIENCE

Rutgers University

June 2020 – Present

Thesis Research

- Research in Experimental Mathematics under the guidance of Dr. Doron Zeilberger

Boston College Mathematics Department

Summer 2016

Undergraduate Research Fellow

- Researched computational algebraic number theory under Dr. Ellen Goldstein

Lynch School of Education, Boston College

Fall 2016

Research Assistant

- Researched educational testing with Dr. Michael Russell

PUBLICATIONS AND PREPRINTS

A. Bu and D. Zeilberger. “Using Symbolic Computation to Explore Generalized Dyck Paths and Their Areas.” *Preprint* arXiv:2305.09030 (2023).

A. Bu “A Combinatorial Approach to the Groebner Bases of Ideals Generated by the Elementary Symmetric Functions.” *E-JC* 29 (3) (2022). Article P3.4.

A. Bu and R. Dougherty-Bliss. “Enumerating Restricted Dyck Paths with Context-Free Grammars.” *Integers* 21 (2021). Article 69.

A. Bu “Automated Counting of Restricted Motzkin Paths.” *ECA* 1 (2) (2021). Article S2R12.

TALKS

“Enumerating Restricted Dyck Paths.” New York Combinatorics Seminar. (November 5, 2021).

Mentoring Experience

Rutgers, The State University of New Jersey

Summer 2023

Summer Session Head TA

New Brunswick, NJ

- Served as a mentor and resource for graduate students teaching a summer course
- Conducted teaching observations for graduate students and wrote a review for the math department
- Provided feedback and suggestions to the instructors during the semester

Spectrum Retreat

Spring 2017

Mentor

- Led, gave a talk, and facilitated group discussion on a formation retreat for LGBTQ students at Boston College

Pride Peers

September 2014-May 2017

Mentor and Presenter

- Mentored LGBTQ Boston College students in self-discovery and social, familial, academic, and LGBTQ issues
- Facilitated small group discussion and aided mentees in self-reflection and self-discovery
- Gave presentations and facilitated discussions in dorms and classes about gender identity and sexuality
- Trained by University Counseling Services, University Mission and Ministry, and the Dean of Students Office

PROFESSIONAL DEVELOPMENT

Rutgers Math Teaching Group

September 2020-Present

Active Participant

- Participate in weekly discussions on undergraduate teaching and pedagogical methods
- Led a discussion on how to run workshops online

AWARDS AND HONORS

SAS Fellowship, Rutgers University

Fall 2020-Spring 2021, Spring 2023

Janice Pattwell Annual Mathematics Fellowship, Rutgers University

Fall 2018

Magna Cum Laude, Boston College

Spring 2017

Departmental Honors, Boston College Mathematics Department

Spring 2017

The Order of the Cross and Crown, Boston College

Spring 2017

Dean's List: First Honors, Boston College (7 semesters)

VOLUNTEER EXPERIENCE

Stepping Stones School Volunteer

Summers 2012-2014

- Assisted in classroom for students ages 5-9 with Down syndrome
- Instructed students in speech, sign language, reading, writing, and counting
- Observed and assisted in physical therapy and occupational therapy

Roseland, NJ

LEADERSHIP AND OTHER ACTIVITIES

GRADient

June 2020-Present

President

- President of the LGBTQ+ professional and graduate student association at Rutgers University
- Worked to make GRADient a recognized Graduate Student Organization

Undergraduate Government of Boston College

April 2015- May 2016

Coordinator (2015), Asst. Director of Gender Programming (2016) - GLBTQ Leadership Council

- Planned, organized, and implemented campus wide events that promote awareness on LGBTQ+ issues