

Creating Pathways to a Math PhD

A Conversation with Bridge Program Founders and Directors



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OLSUME

Online Seminar on Undergraduate Mathematics Education – 5 November 2024

The Causeway Postbaccalaureate Program

- Causeway's mission is to expand opportunities for students from historically underrepresented groups to enroll in doctoral programs in the mathematical sciences in the United States. (<https://sites.northwestern.edu/causeway/>)
- Runs July through June, applications due in March
- Three tracks: pure mathematics, applied mathematics, statistics
- Internal evaluation study to gauge effectiveness



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The Causeway Postbaccalaureate Program

- Coursework: foundational course in summer, courses during academic year chosen to strengthen background
- Research: summer project under supervision of faculty mentor, possibility of continuing during academic year
- Mentoring: seminars, preparing applications for graduate school, activities with other groups and local math circle
- Successful placement in PhD programs: 13 of 18 students



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Northwestern University

Smith College Center for Women in Mathematics

- For women and gender minorities
- Provides intensive training in math at the advanced undergraduate level
- Embeds in a math community that is fun, friendly, & supportive, and also serious & ambitious about math
- Two semesters, approximately 8 students per year
- Big umbrella, including: returning to math after years, non-math major, very little background, tiny undergrad
- Since 2016: 93% enter graduate programs the year after Smith, $\frac{2}{3}$ in PhD programs. *The others are not failures.*
- High ceiling: NSF Fellowships; PhDs and Postdocs at Berkeley, Dartmouth, Brown, Cornell
- Awards: AMS Programs that Make a Difference 2011; AMS Award for Exemplary Program in a Math Dept 2023



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Smith College Center for Women in Mathematics

- Coursework: individually tailored to interests and backgrounds in theoretical/applied math and stats
 - Some students enter without a proof course
 - Some students every year take UMass grad algebra
- Research: small-group research projects both semesters and sometimes summer, often publications
- Mandatory course *Dialogues*: builds cohort cohesion, interviews mathematicians, guides in applications, develops mathematical identity
- Community: required conference and seminar participation
- Mentoring: intense one-on-one mentoring



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Smith College

Iowa State University Mathematics Postbac Program

Designed to offer students a transformative and transitional experience into advanced degree programs in the mathematical sciences.

Use mentoring, professional development, and coursework to prepare students for the application process and the first year or two of a graduate program.

What students attend this program?

- Additional preparation
- Discipline change
- Transition back to academia
- Uncertain about graduate school
- Strengthen self-confidence/resilience



Michael Young
Carnegie Mellon University

Iowa State University Mathematics Postbac Program

- One year program
- Certificate Program, nondegree seeking grad students
- 4-8 students per year
- Two courses + 1 seminar per semester
 - ~½ ISU MS Requirements
- TA Assignment
- ½ Tuition + Graduate Student Stipend
- No research component



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