

ANDREA BOURQUE

CONTACT

E-mail andrea.bourque72@gmail.com

EDUCATION

- **Ph.D. in Mathematics (In Progress)** 2024-present
University of Chicago | Chicago, Illinois, USA
 - Advisor: Victor Ginzburg
 - **M.S. in Mathematics** 2022-2024
Louisiana State University | Baton Rouge, Louisiana, USA
 - Advisor: Pramod Achar
 - **B.S. in Mathematics** 2020-2022
Louisiana State University | Baton Rouge, Louisiana, USA
 - Graduated with *summa cum laude*; college honors; university medal
 - Honors Thesis: “ $GL(1|1)$ Graph Connections”
 - Minor in Physics

HONORS

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|--------------|---|
| Awards | <ul style="list-style-type: none">• 2022 Betti and Robert Giles Senior Mathematics Award• 2020 Eric Candell Excellence in Physics Award• 2019 AMC 12 A Distinguished Honor Roll |
| Scholarships | <ul style="list-style-type: none">• 2021 Peg and Tom Madden Mathematics Research Scholarship |

PAPERS

- A. Bourque and P. Achar (2024). "On global Schubert varieties for the general linear group". Preprint. URL: <https://www.arxiv.org/abs/2412.01962>.

A. Bourque and A. Zeitlin (2023). "Flat $GL(1|1)$ -connections and fatgraphs". In: *Journal of Geometry and Physics* 191. URL: <https://arxiv.org/abs/2208.08033>.

TALKS

- **Representation Theory Student Seminar** 2025
UChicago, Chicago, IL
 - Talk 1: "Basics of affine Springer fibers"
 - Talk 2: "Construction of representations of affine Weyl groups"
 - **Women in Math Day** 2025
UChicago, Chicago, IL
 - Talk: "Möbius Inversion as Generalized PIE."

- **Representation Theory and Related Geometry: Progress and Prospects** 2024
University of Georgia, Athens, GA
 ○ Talk: "Global Schubert varieties for GL_n ."
- **Oberwolfach Workshop 2331 - Teichmüller Theory** 2023
Mathematisches Forschungsinstitut Oberwolfach, Germany
 ○ Talk: "Flips on $GL(1|1)$ Graph Connections."
- **Bayou Arithmetic Research Days 1** 2022
LSU, Baton Rouge, Louisiana
 ○ "Lightning" talk: "Geometry from Partitions."
- **UH-LSU-TAMU Undergraduate Math Research Conference** 2022
University of Houston, Texas
 ○ Talk: " $GL(1|1)$: A Primer in Supermathematics."
- **Symposium for Undergraduates in the Mathematical Sciences** 2021,2022
Online
 ○ Talks: " $GL(1|1)$ Graph Connections" in both years.
- **LSU Dean's Circle Science & Spirits** 2021
LSU Health Medical Education & Innovation Center, Baton Rouge, Louisiana
 ○ Poster: " $GL(1|1)$ Graph Connections", for LSU College of Science donors.
- **LSU Discover Day** 2021
Online
 ○ Talk: " $GL(1|1)$ Graph Connections."
- **TX-LA Undergraduate Math Conference** 2020
Online
 ○ Talk: "Teichmüller theory and graph connections for $G = GL(1|1)$."
- **Texas Undergraduate Math Conference** 2019
UT Tyler, Texas
 ○ Talk: "Hyperbolic Space, Möbius Transformations, and Teichmüller Theory."

PROGRAMS ATTENDED

- **Summer School on Enumerative Geometry and Geometric Representation Theory** 2025
University of Pisa, Italy
- **Arizona Winter School** 2025
University of Arizona, Tuscon
- **Arizona Winter School** 2024
Project: Chow Motives of Abelian Varieties | University of Arizona, Tuscon
- **Bayou Arithmetic Research Days 3** 2023
LSU, Baton Rouge, Louisiana

- Preliminary Arizona Winter School 2023
Abelian Varieties over Finite Fields | *Online*
- Preliminary Arizona Winter School 2024
Local Fields | *Online*
- MSRI/SLMath 992 - Derived Algebraic Geometry 2023
UC Berkeley, California
- Southern Regional Number Theory Conference 2022-2024
LSU, Baton Rouge, Louisiana
- Western Algebraic Geometry Symposium 2022
UC Riverside, California

TEACHING

- College Fellow 2025-2026
UChicago, Chicago, Illinois
 - TA for Honors Calculus IBL.
- Research Experience for Undergrads 2025
UChicago, Chicago, Illinois
 - Advised an undergraduate student in learning cardinals and the continuum hypothesis.
- Directed Reading Program 2023
LSU, Baton Rouge, Louisiana
 - Advised an undergraduate student in learning representation theory of finite groups.
- MATH 7001 and 7002 2022-2023
Communicating Math I and II | *LSU, Baton Rouge, Louisiana*
 - 15 minute lecture on trigonometric identities to an LSU trigonometry class.
 - 50 minute lecture on hyperbolic trigonometric functions to an LSU calculus I class.
 - 15-20 minute introductory lecture on manifolds, differential forms, and Stoke's theorem to first year LSU graduate students in mathematics. The lecture was accompanied by a 10 page expository paper on the same topic.
- Teacher and Personal Tutor 2021-2022
for SpiderSmart's Katy, Texas branch | *Online*
 - AMC 8 competition preparation course, twice.
 - Several sections of a course to prepare students to test out of 6th grade math.
 - Course in precalculus.
 - Privately tutored students of various levels, ranging from elementary school to AP Calculus BC.
- Upper Level Math Teacher 2020-2021
for Louisiana Math Circle Competition Team | *Online*
 - Taught skills, concepts, and strategies for the AIME competition.
- Peer Tutor in Math and Physics 2019-2020
LSMSA, Natchitoches, Louisiana

- **GED Math Tutor** 2018-2019
LSMSA, Natchitoches, Louisiana
 - Helped under-privileged students prepare to get a GED.

LEADERSHIP

- **Assistant** 2021-2022
for Louisiana Math Circle Competition Team | Online
 - Created homework assignments and mock tests.
 - Proctored competitions.
- **Math Club President** 2018-2020
at Louisiana School for Math, Science, and the Arts | Natchitoches, LA
 - Gave lectures and corresponding problem sets for introductory topics in logic, proofs, and competition math.
 - Organized participation in competitions, such as "Who Wants to Be a Mathematician" and LSU's annual math competition.
 - Started a math tutoring center after our original peer tutoring center went out of use.