# Kaden Saucedo

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## EDUCATION

**University of Georgia**                                                        August 2023 – Present
*Ph.D. in Mathematics (in progress), Advisor: Valery Alexeev*                              *Athens, GA*
**Kansas State University**                                                       May 2021 – May 2023
*Bachelor of Science in Mathematics*                                                   *Manhattan, KS*
**Wichita State University**                                                    August 2019 – May 2021
                                                                                         *Wichita, KS*

## RESEARCH

**Kappa Classes on Moduli of Stable Marked del Pezzo Surfaces**
- Studying the intersection-theoretic properties of $\kappa$ classes on KSBA moduli spaces of stable marked del Pezzo surfaces under the advisement of Valery Alexeev.
- Developing explicit computations of $\kappa_i$ classes via boundary stratifications and degenerations of stable pairs.

## INDEPENDENT STUDIES AND DIRECTED READINGS

**Intro to Homological Algebra DRP** | *Advised by David Marcus, Dr. Zongzhu Lin*    September 2022 – May 2023
- Read Dr. Sophie Morel's (Princeton) lecture notes on homological algebra under the instruction of Ph.D. student David Marcus and Prof. Zongzhu Lin.
- Topics included limits, abelian categories, complexes, exact functors, triangulated categories, derived categories, and model categories.
- Concluded with a presentation titled "Additive Categories," introducing categorical notions and proving results about kernels in additive categories.

**Quintic Polynomials & Geometry Independent Study** | *Advised by Dr. Buma Fridman*    May 2021 – May 2022
- Worked through exercises leading to topics in field theory and straightedge-compass geometry.
- Topics included field automorphisms, the fundamental theorem of Galois theory, Kummer extensions, solvability by radicals, and constructibility of polygons.
- Additional reading focused toward Hilbert's thirteenth problem.

**Intro to Category Theory DRP** | *Advised by David Marcus, Dr. Gabriel Kerr*    September 2021 – December 2021
- Read Saunders Mac Lane's *Categories for the Working Mathematician* with Ph.D. student David Marcus.
- Topics included categories, functors, natural transformations, universal properties, Yoneda's lemma, pushouts/pullbacks, and adjunctions.
- Culminated in a chalk talk titled "Introduction to Categories," motivating examples and concluding with Yoneda's lemma.

## WORKSHOPS ATTENDED

**CMND Undergraduate Workshop – Geometry & Topology RTG**             August 1, 2022 – August 5, 2022
*University of Notre Dame*                                                              *Notre Dame, IN*
- Two-part undergraduate workshop on topology and differential geometry featuring talks by faculty and student presentations.
- Included topics on topological spaces, surfaces, knots, curvature, and Gauss–Bonnet.
- Faculty talks included partial differential equations (Qing Han), Morse theory (Pavel Mnev), and conformal maps (Jeff Diller).

## TALKS

**Graduate Student Seminar**
*University of Georgia*                                                                     *Athens, GA*
- Talk on moduli of del Pezzo surfaces and computations involving $\kappa$ classes.

**Graduate Topology and Algebraic Geometry Student Seminar**
*University of Georgia*                                                                     *Athens, GA*
- Talk on intersection theory and degenerations of surfaces in moduli.

**K3 Surface Seminar**
*University of Georgia*                                                                     *Athens, GA*
- Talk on examples and geometry of K3 surfaces.

## Teaching Experience

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|---|---|
| **Instructor, MATH 2250: Calculus I** | Spring 2025 |
| *University of Georgia* | *Athens, GA* |
| **Instructor, MATH 1113: Precalculus** | Fall 2024 |
| *University of Georgia* | *Athens, GA* |
| **Recitation Instructor, MATH 2200: Business Calculus** | Fall 2023 |
| *University of Georgia* | *Athens, GA* |
| **Grader, MATH 3510: Multivariable Mathematics II** | Spring 2024 |
| *University of Georgia* | *Athens, GA* |
| **Grader, MATH 3500: Multivariable Mathematics** | Fall 2023 |
| *University of Georgia* | *Athens, GA* |
| **Directed Reading Mentor** | 2024 – 2025 |
| *Topics included Category Theory and Algebraic Surfaces* | |

## Service and Leadership

Co-organizer, Graduate Student Seminar, University of Georgia.

Co-organizer, Graduate Topology and Algebraic Geometry Student Seminar, University of Georgia.

Vice President, University of Georgia Chapter of the AMS.

Assisted with UGA Math Circles events.

Assisted in writing and maintaining a UGA-affiliated high school mathematics competition.

## Other Employment

**Kansas State University Libraries** | *Manhattan, KS*                                 May 2022 – July 2023
- Math/Physics Student Specialist: staffed the Math/Physics counter, handled materials, and assisted patrons.

**Mathnasium Learning Center** | *Wichita & Manhattan, KS*                         February 2020 – July 2023
- Instructor for students from second grade through high school, delivering individualized instruction in both virtual and in-person formats.

**Kansas State Student Union** | *Manhattan, KS*                                   September 2021 – May 2022
- Films assistant for the Union Program Council; supported event operations including ticketing and projection booth management.

**Kansas State Physics Department** | *Manhattan, KS*                               January 2022 – May 2022
- Learning assistant for PHYS 113 (General Physics I); facilitated problem-solving sessions and attended weekly pedagogy meetings.

## Skills

**Computational Tools:** Sage (basic), TikZ (strong), GitHub (working)
**Programming:** C++
**Typesetting:** LaTeX
**Languages:** English (native), Spanish (reading proficiency)