

REESE LANCE – CV

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EDUCATION

University of Texas at Austin
B.S. Mathematics, B.S. Physics

Graduated May 2021

University of North Carolina - Chapel Hill
PhD, Pure Math

Aug 2021 - present

RESEARCH INTERESTS

- Generally interested in algebraic and differential geometry and topology in their own right, as well as their applications to physics, such as string theory, QFT, and mirror symmetry
- Complex geometry including Kähler/CY/K3's
- Geometric representation theory
- Categorical representation theory, especially geometric Langlands

RESEARCH AND INDEPENDENT STUDY

Lie Symmetry Analysis

Mathematical Physics - Original Research

November 2017 - May 2019

Mentor: Dr. Richard Hazeltine

- Study of Lie Symmetries and exact solutions of Charney-Hasegawa-Mima Equation and the Reduced Magnetohydrodynamics system.
- Employed Symmetry Analysis methods involving Lie Groups and Algebras and the elongated Lie operator.
- Mostly involved chalkboard mathematical work, but also wrote a program in Mathematica to assist with equation manipulation.
- [Pre-print](#), [arXiv:1906.11276].

CONFERENCES ATTENDED

[Western Algebraic Geometry Symposium \(WAGS\)](#)

Colorado State University, April 2022

[Categorical Methods in Representation Theory and Quantum Topology](#)

University of Virginia, April 2022

[Triangle Area Graduate Mathematics Conference \(TAGMAC\)](#)

North Carolina State University, April 2022

[Triangle Area Graduate Mathematics Conference \(TAGMAC\)](#)

Duke University, November 2021

[Between Topology and Quantum Field Theory](#)

University of Texas, January 2019

TALKS GIVEN

End of semester presentations for AG course at UNC

Introduction to Kahler geometry and Hodge theory - *May 2022*

[UNC-CH GMA Visions Seminar](#)

How Many Linearly Independent Vector Fields Can Fit on the n -Sphere? - *October 2021*

UT Austin DRP

Vector Bundles and Principle Bundles - What's the Connection? - *Spring 2019*

The Bordism Ring and Category - Spring 2018

Capital of Texas Undergraduate Research Conference

Design and Detection of a Deuterium-Deuterium Inertial Electrostatic Confinement

- Spring 2019

TEACHING EXPERIENCE

Calc-Lab: University of Texas

Jan 2017-May 2021

- Calc-lab employees gather in an informal setting where students from math classes come to ask questions and seek advice on topics ranging from beginner's calculus/pre-cal to multivariable/vector calculus and differential equations.
- We assist students one on one and try to guide them to the answers by asking the right questions, or will occasionally lecture when there are critical concepts missing.

Math Help Center

Aug 2021-present

- UNC-CH equivalent of Calc-Lab

Teaching Assistant - UT

Jan 2017-present

- I have been a TA for: differential, integral, and vector calculus, "specialized" classes such as calculus for engineers/business students, discrete mathematics, and a freshman research class, aimed at introducing new math majors to performing and presenting research.

Teaching Assistant Class/Training

Jan 2019 - May 2019

- Course at UT Austin where we are trained to become better teaching assistants. We discuss teaching philosophy, what makes a good teacher, and receive hands-on teaching experience. We shadowed current mathematics professors during their lectures, and reflect (in writing and in person conversations) what we learned from watching the professor.

Teaching Seminar

Aug 2021- Dec 2021

- Teaching Seminar at UNC-CH.

TA and Grading: UNC-CH

Aug 2021-present

- Fall 2021: TA for MATH 231, differential calculus, grading for MATH 381, discrete mathematics.