

# Guanyu Li

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🌐 <https://sites.google.com/view/guanyu-li-math/home>

## Education

- August 2018 – August 2025    📖 **Ph.D in Mathematics**,  
Cornell University, Ithaca, NY  
Advisor: Yuri Berest  
Thesis title: Derived commuting schemes, representation homology, and cohomology of Lie algebras
- August 2014 – June 2018    📖 **BS in Mathematics and Applied Mathematics**,  
Sun Yat-sen University, Guangzhou, China.

## Interests

- 📖 My major mathematical research interests are derived algebraic geometry, algebraic geometry, homological algebra, and homotopy theory. I am also interested in the fields related to derived algebraic geometry such as representation theory, category theory, algebraic topology, complex geometry, and mathematical physics.
- 📖 Most of my current projects are related to representation homology, which is a DAG object modeling derived representation scheme. I focus on computational aspects of the object and manage to connect the higher information to the original algebro-geometric spaces. I'm very interested in the connections of representation homology with other (co)homology theories.

## Preprints and Publications

- 1 M. K. Brown, S. Dey, **G. Li**, M. Sayrafi, *Computing global Ext for complexes*, arXiv:2509.25103, 2025.
- 2 **G. Li**, *A Step towards Computational Derived Algebraic Geometry: The RepHomology Package For Macaulay2*, arXiv:2410.18383, 2024.
- 3 **G. Li**, *Commuting Varieties of Upper Triangular Matrices and Representation Homology*, arXiv:2403.13953, Provisionally accepted by J. Algebra.

## Teaching

### Cornell University

Fall 2025	📖 <b>MATH 1920 - Multivariable Calculus for Engineers</b>	Recitation TA.
	📖 <b>MATH 2940 - Linear Algebra for Engineers</b>	Recitation TA.
Spring 2025	📖 <b>MATH 2310 - Linear Algebra for Data-science</b>	Recitation TA.
Fall 2024	📖 <b>MATH 4310 - Linear Algebra</b>	Grader.
Spring 2024	📖 <b>MATH 4180 - Complex Analysis</b>	Grader.
Fall 2023	📖 <b>MATH 1110 - Calculus I</b>	Instructor.
Summer 2023	📖 <b>MATH 1110 - Calculus I</b>	Grader.
Spring 2023	📖 <b>MATH 6510 - Algebraic Topology</b>	Grader.
Fall 2022	📖 <b>MATH 1110 - Calculus I</b>	Instructor.

## Teaching (continued)

Summer 2022	📖	MATH 2940 - Linear Algebra for Engineers	Grader.
Spring 2022	📖	MATH 6510 - Algebraic Topology	Grader.
Fall 2021	📖	MATH 3040 - Prove It!	Grader.
Summer 2021	📖	MATH 1110 - Calculus I	Grader.
Spring 2021	📖	MATH 6320 - Algebra	Grader.
Fall 2020	📖	MATH 2210 - Linear Algebra	Recitation TA.
Summer 2020	📖	MATH 1920 - Multivariables for Engineers	Grader.
Spring 2020	📖	MATH 4280 - Introduction to PDE	(Partial) Grader.
Fall 2019	📖	MATH 2210 - Linear Algebra	Recitation TA.
Spring 2019	📖	MATH 4500 - Matrix Groups	Grader.

## Talks

Algebra Seminar, Cornell	<b>Commuting Varieties of Upper Triangular Matrices and Representation Homology</b> Friday, March 08, 2024
BUGCAT, Binghamton University	<b>Representation homology and some computations with unipotent coefficients</b> Saturday, November 11, 2023
Sun Yat-sen University	<b>Deriving the representation variety</b> Friday, June 09, 2023
Olivetti Club, Cornell	<b>Algebraic Topology is Inevitable</b> Tuesday, March 28, 2023
	<b>Why Should Algebraic Geometry be Derived?</b> Tuesday, November 5, 2019

## Miscellaneous Experience

2024-2025	<b>Teaching Development Fellow</b> for the department of mathematics, organizing the bi-weekly teaching seminar, helping coordinate peer observations, and working on a small reading project for the spring semester to support TA professional development.
2022	<b>Teaching training program facilitator</b> for the department of mathematics.