Guanyu Li

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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 research interests are derived algebraic geometry, algebraic geometry, representation theory and homotopy theory, as well as fields related to derived algebraic geometry such as homological algebra and algebraic topology.

- Most of my current projects are related to representation homology, which is a DAG object modeling derived representation scheme. I primarily focus on the computational aspects of these objects and on the connections between their higher information, the underlying algebro-geometric spaces, and classical results in other fields.

Preprints and Publications

1. Michael K. Brown, Souvik Dey, **Guanyu Li**, and Mahrud Sayrafi. *Computing global Ext for complexes*. arXiv:2509.25103. 2025.
2. **Guanyu Li**. *A Step towards Computational Derived Algebraic Geometry: The RepHomology Package For Macaulay2*. arXiv:2410.18383. 2024.
3. **Guanyu Li**. "Commuting schemes of upper triangular matrices and representation homology". In: *Journal of Algebra* 688 (2026), pp. 420–444. ISSN: 0021-8693. DOI: https://doi.org/10.1016/j.jalgebra.2025.10.006.

Teaching

Cornell University

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

Teaching (continued)

Fall 2022	**MATH 1110 - Calculus I**	Instructor.
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 and Number Theory Seminar , LSU	**Derived Commuting Schemes, Representation Homology, and Cohomology of Lie Algebras** October 21, 2025
Midwest Panorama, Iowa U	**Lie (co)homology and representation homology** June 08, 2025
Gone Fishing, Washington U	**Representation homology and Lie algebra cohomology of nilpotent algebras** Friday, March 07, 2025
Algebra Seminar, Cornell	**Commuting Varieties of Upper Triangular Matrices and Representation Homology** Friday, March 08, 2024
BUGCAT, Binghamton University	**Representation homology and some computations with unipotent coefficients** Saturday, November 11, 2023
Sun Yat-sen University	**Deriving the representation variety** Friday, June 09, 2023
Olivetti Club, Cornell	**Algebraic Topology is Inevitable** Tuesday, March 28, 2023
	Why Should Algebraic Geometry be Derived? Tuesday, November 5, 2019

Miscellaneous Experience

2024-2025	**Teaching Development Fellow** 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	**Teaching training program facilitator** for the department of mathematics.