Sai Sivakumar

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University of Texas at Austin

Research Interests

Representation theory, mathematical physics

Education

2024–	**Ph.D., Mathematics**, *University of Texas at Austin*
2020–2024	**B.Sc. Summa Cum Laude, Mathematics**, *University of Florida*
2020–2024	**Minors in Physics, Computer Science**, *University of Florida*

Works

Publications

[1] **On virtual resolutions of points in a product of projective spaces**
I. Bailly-Hall, C. Berkesch, K. Dovgodko, S. Guan, S. Sivakumar, J. Sun (2024). (arXiv, Journal of Pure and Applied Algebra)

[2] **Ideals preserved by linear changes of coordinates in positive characteristic**
B. Cattell-Ravdal, E. Delargy, A. Ganguly, S. Guan, T. Karn, M. Perlman, S. Sivakumar (2024). (arXiv, Communications in Algebra)

Miscellaneous

[3] **Strong multiplicity one for classical modular forms**
S. Sivakumar (2024). Senior thesis. (PDF)

Talks and Presentations

Sep. 2025	Introduction to Koszul duality: S-Lambda duality, (two talks) UT Austin GRANT (Geometry, Representation theory, Algebra, and Number Theory) Seminar
Apr. 2025	Schur functors and the representation theory of the general linear group UT Austin Junior Geometry Seminar
Apr. 2025	D-modules and chiral algebras UT Austin Junior Geometry and Quantum Field Theory Seminar
Feb. 2025	The cobordism hypothesis in one dimension UT Austin Junior Geometry and Quantum Field Theory Seminar
Oct. 2024	Local systems, monodromy, elliptic curves, and the Picard-Fuchs equation UT Austin GRANT (Geometry, Representation theory, Algebra, and Number Theory) Seminar
Jan. 2024	On virtual resolutions of points in a product of projective spaces Joint Mathematics Meetings 2024, in the AMS Contributed Paper Session on Commutative Algebra and Related Topics
Jan. 2024	Ideals preserved by linear changes of coordinates in positive characteristic Joint Mathematics Meetings 2024, in the AMS Contributed Paper Session on Commutative Algebra and Related Topics
Oct. 2023	Virtual resolutions of points in $\mathbb{P}^n \times \mathbb{P}^m$ UF Algebra Seminar
Apr., Jul. 2023	Fourier analysis on LCA groups and Pontryagin duality For Dr. Sin's Introduction to Representation Theory class; for the Student Summer Representation Theory Seminar at the University of Minnesota, Twin Cities.

Feb. 2022	Combinatorial proof of existence of Sylow subgroups
	UF Algebra seminar
Falls	Annual LaTeX seminar
2021–2023	Joint with the UF Graduate Mathematics Association (GMA) and the UF Association for Women in Mathematics (AWM) chapter.

Conferences and Workshops

Mar. 2025	Texas Algebraic Geometry Symposium, *Texas A&M University*
Jan. 2024	Joint Mathematics Meetings, *San Francisco*

Teaching

Fall 2025	**Teaching Assistant**, *M 427J*: Differential Equations with Linear Algebra
Spring 2025	**Teaching Assistant**, *M 427L*: Advanced Calculus for Applications II
Fall 2024	**Teaching Assistant**, *M 408N*: Differential Calculus for Science
2021, 22 AY	**Teaching Assistant**, *MAP2302*: Elementary Differential Equations

Outreach and Service

Aug. 2024–	Member of the Austin Civic Wind Ensemble
	Part of the clarinet section.
Oct. 2024–	Volunteer at the Sunday Morning Math Group at UT Austin
	Exposes local junior high and high school students to fun and engaging topics in mathematics not typically appearing in the curricula; this group also hosts the AMC 8, 10, and 12 exams.
2024–	Member of the Graduate Representative Committee at UT Austin
	We interface with UT Austin's graduate students by representing the interests of the graduate students in the department, and we organize events and tea.
2024 AY	Organizer of the Sophex seminar at UT Austin
	This seminar gives first-year graduate students a low-pressure environment to practice giving talks.
2021, 22, 23 AY	Officer of the University Math Society at UF
	President, formerly Academic Director. Managed the club, collaborated with the AWM chapter and the GMA, ran its seminar, and encouraged an inclusive environment.
Mar. 2021–	Moderator for a large online mathematics community
	Exceeding 270,000 members globally, it seeks to stimulate mathematical discussion and interest, as well as to provide assistance with math.

Honors and Awards

2023	The Kermit Sigmon Scholarship.
	$200, awarded every spring to promising undergraduate mathematics majors.

Skills

LaTeX	6+ years
Macaulay2	Used in both REUs I attended
Java, C++	In my undergraduate studies