

SHANA YUNSHENG LI

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EDUCATION

University of Illinois Urbana-Champaign	2024 - Now
Ph.D. in Mathematics	Advisor: Nathan Dunfield
Southern University of Science and Technology	2022 - 2024
M.Sc in Mathematics	Advisor: Stavros Garoufalidis
Southern University of Science and Technology	2018 - 2022
B.Sc in Mathematics and Applied Mathematics with Honors	

RESEARCH INTEREST

Low-dimensional Topology; Mathematical Physics; Quantum Topology; Knot Theory; Hyperbolic 3-Manifolds.

ACADEMIC VISITS

Simons Laufer Mathematical Sciences Institute	Jan. 2026 - Feb. 2026
Program Associate	Topological and Geometric Structures in Low Dimensions

GRANTS & FUNDING

ACCESS Discover Allocation (MTH260046, 1,500,000 ACCESS Credits)	2026 - 2027
Principal Investigator	The 12-tetrahedra census of orientable cusped hyperbolic 3-manifolds

PUBLICATIONS

4. Fixed-parameter tractable computation of knot polynomials of Reshetikhin–Turaev type via tensor networks, preprint, 12 pages.
3. The complete 10-tetrahedra census of orientable cusped hyperbolic 3-manifolds, to appear in Proceedings of the 42nd International Symposium on Computational Geometry (SoCG 2026), 16 pages, arXiv:2512.02142.
2. (with Stavros Garoufalidis) Patterns of the V_2 -polynomial of knots, to appear in Experimental Mathematics, 25 pages, arXiv:2409.03557.
1. (with Ni An and Stavros Garoufalidis) Algebraic aspects of holomorphic quantum modular forms, Research in Mathematical Sciences. 11 (2024) no. 3, Paper No. 54, 1-20.

PROJECTS

5. (with Stavros Garoufalidis and Josephine Yu) Positivity and concavity of the colored Links–Gould polynomials of knots. Drafting
4. (with Stavros Garoufalidis) The loop expansion of colored knot polynomials for Lie superalgebras. Ongoing
3. Extending tabulation of quasi-alternating links. Ongoing
2. Census of 12 tetrahedra oriented cusped hyperbolic 3-manifolds. Ongoing
1. Census of 11 tetrahedra oriented cusped hyperbolic 3-manifolds. Drafting

THESES

- M.Sc** On the Quantum Modularity Conjecture for Knots
B.Sc Foundation of Supergeometry and Its Application in Mathematical Physics

TALKS

- May. 2026** Invited online talk at Graduate Topology Seminar (SUSTech).
Topic: Introduction to Reshetikhin–Turaev knot polynomials.
- Mar. 2026** Seminar talk at Graduate Geometry-Topology Seminar (UIUC).
Topic: The complete census of orientable cusped hyperbolic 3-manifolds, up to 11 tetrahedra.
- Feb. 2026** Invited seminar talk at Computation in Geometric Topology, Topological and Geometric Structures in Low Dimensions, at Simons Laufer Mathematical Sciences Institute (SLMath).
Topic: The complete census of orientable cusped hyperbolic 3-manifolds, up to 11 tetrahedra.
- Nov. 2025** Invited online talk at Australian Geometric Topology Webinar.
Topic: Multivariable knot polynomials, the V_n -polynomials, and their patterns.
- Oct. 2025** Invited talk at AMS 2025 Fall Central Sectional Meeting at Saint Louis University, Special Session on Foliations and 3-manifolds.
Topic: The complete census of orientable cusped hyperbolic 3-manifolds, up to 10 tetrahedra.
- Sep. 2025** Online talk at Equivariant Topological Quantum Field Theory workshop at Casa Matemática Oaxaca (CMO).
Topic: Multivariable knot polynomials, the V_n -polynomials, and their patterns.
- Sep. 2025** Seminar talk at Group, Geometry and Topology Seminar (UIUC).
Topic: Multivariable knot polynomials, the V_n -polynomials, and their patterns.
- May. 2025** Conference talk at GTA Philadelphia 2025, 10th annual Graduate Student Conference in Algebra, Geometry, and Topology (GSCAGT) at Temple University
Topic: Multivariable knot polynomials, the V_n -polynomials, and their patterns.
- Apr. 2025** Invited online talk at Shanghai Institute for Mathematics and Interdisciplinary Sciences (SIMIS).
Topic: Multivariable knot polynomials, the V_n -polynomials, and their patterns.
- Mar. 2025** Seminar talk at Graduate Geometry-Topology Seminar (UIUC).
Topic: Multivariable knot polynomials, the V_n -polynomials, and their patterns.
- Mar. 2024** Seminar talk at Graduate Topology Seminar (SUSTech).
Topic: The Teichmüller TQFT and the quantum modularity conjecture.

TEACHING

- Spring 2025** IML graduate leader of undergraduate research project Visualizing Spaces of Curves in 3-manifolds.
- Autumn 2022** Teaching assistant of MA109 (Advanced Linear Algebra).

AWARDS

- Spring 2024** Outstanding Graduate Graduates Award
Outstanding Master Thesis Award
- Autumn 2022** Outstanding Teaching Assistant Award
- Spring 2022** Outstanding Undergraduate Graduates Award
Outstanding Undergraduate Thesis Award

OUTREACH - PIANO PERFORMANCES

Autumn 2023	“Moment · Eternity” Concert	Steinway Garden in Shenzhen Concert Hall
Spring 2022	“Youth Poetry and Music” Chamber Music Concert	Shenzhen Concert Hall
Autumn 2021	National Science & Technology University Aesthetic Education Seminar Concert	Steinway Garden in Shenzhen Concert Hall
Autumn 2020	Lang Lang’s Piano Masterclass	SUSTech 10th Anniversary
Autumn 2019	Haochen Zhang’s Piano Masterclass	