

# Shihan Kanungo

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## EDUCATION

Henry M Gunn High School GPA 3.96/4.46W | San José State University (SJSU) GPA 4.0 ..... 2022–2026

## SELECTED HONORS

- USAMO (USA Math Olympiad) ('22 '25); Gold award ('25)
- MAA's Math Olympiad Program, 'Blue' MOP ('25)
- USAPhO (USA Physics Olympiad) Gold Medal & US Physics Team ('24)
- 85th Annual Putnam Competition. Honorable mention ('24)
- S.-T. Yau Science Award. USA Bronze medal in Mathematics ('24)
- WSS, World Science Scholar ('24)
- Spirit of Ramanujan \$2k Fellowship ('23)
- USAMTS Gold Medal and highest scorer ('23, '25)
- 2025 Global Child Prodigy Award. Recipient ('25)
- AIME, 6-time qualifier. 13/15 ('25); 11/15 ('22, '24)

## RESEARCH HIGHLIGHTS

**MIT PRIMES-USA** (Combinatorics, Representation Theory, Commutative Algebra)

- Twisted Yangians in Complex Rank (with A.S. Kannan) [[arXiv](#)] Submitted to *Journal of Algebra* (2025)
- Mixed Tensor Products, ..., and Newton's Formula for  $\mathfrak{gl}(m|n)$  (with S. Erat, A.S. Kannan) [[arXiv](#)] *Transform. Groups.* (2025)
- The Length Finite Factorization Property. (with H. Jiang, H. Kim) [[arXiv](#)] *Commun. Korean Math. Soc.* **39** (2024), no. 2, 313–329. (2024)

**San José State University (SJSU)** (Number Theory)

- On Product Formulas of Guillerá and Sondow (with J. Schettler) [[arXiv](#)] Submitted to *Amer. Math. Monthly* (2024)

## ADVANCED COURSEWORK

San José State University (Graduate courses shown in color)

A+	MATH 231A Real Analysis	Slobodan Simic	..... '24 F
A+	MATH 231B Functional Analysis	Slobodan Simic	..... '25 Sp
—	MATH 233A Applied Mathematics I	Daniel Brinkmann	..... '25 Sp
A+	MATH 234 Advanced Dynamical Systems	Liam Stanton	..... '24 Sp
—	MATH 285A Stochastic Methods	Liam Stanton	..... '25 Sp
A+	MATH 229 Advanced Matrix Theory	Wasin So	..... '24 F
A+	MATH 285M Nonnegative Matrices	Wasin So	..... '25 Sp
A+	MATH 279A Graph Theory	Yan Zhang	..... '24 F
A+	MATH 226 Theory of Numbers	Jordan Schettler	..... '24 Sp
A	MATH 39 Linear Algebra I	Dashiell Fryer	..... '23 F
A+	MATH 129B Linear Algebra II	Wasin So	..... '24 Sp
A+	MATH 131A Introduction to Analysis	Tim Hsu	..... '24 Sp
A+	MATH 131B Introduction to Real Variables	Tim Hsu	..... '24 F
A+	MATH 138 Complex Variables	Liam Stanton	..... '23 F
A+	MATH 179 Introduction to Graph Theory	Sogol Jahanbekam	..... '24 F

Euler Circle (Grades not assigned)

Combinatorial Game Theory ..... 2024–'25

Analytic Number Theory, Ergodic Theory, Number Theory . 2023–'24

Differential Geometry, Generating Functions ..... 2021–'22

Markov Chains, Abstract Algebra, Real Analysis ..... 2020–'21

Art of Problem Solving (AoPS)

Group Theory (A+), Calculus (A+) ..... 2020–23

**Technical Skills:** Python, Java, MATLAB,  $\LaTeX$ , Asymptote.

**Languages:** English (native) & French (beginner).

## EXPOSITORY PAPERS

- David Gale's Subset Takeaway Game, Combinatorial Game Theory ('24)
- Space-Filling Curves, Real Analysis ('24)
- The Hahn-Banach Theorem and Applications, Functional Analysis ('25)
- Sobolev Spaces and Applications to PDEs, Theory of PDEs ('25)
- The Stochastic Gradient Descent Method, Stochastic Methods ('25)
- Chromatic Polynomials, Graph Theory ('24)
- Lagrangian and Hamiltonian Mechanics, Dynamical Systems ('24).
- Large Gaps Between Primes, Analytic Number Theory ('24)
- Dynamical Billiards, Ergodic Theory ('24)
- Arithmetic Dynamics, Number Theory ('23)
- Minimal surfaces, Differential Geometry ('22)
- Herbert Wilf's snake-oil method, Generating Functions ('21)
- Mixing-time estimates for riffle shuffle, Markov chains ('20)
- Classifying groups of certain orders, Algebra ('20)

## CAMPS & PROGRAMS

- MOP (Math Olympiad Program), IMSA, IL. (Jun '25)
- USAPhO Team Training Camp, Univ. of Maryland. (Jun '24)
- The Special Lectures. Kharkiv-Vienna Intl. Sc. School. (Aug '23)

## MUSIC

- Stanford Jazz Workshop (2024)  
Duke Ellington award; Outstanding Musicianship award
- Northern California Young Talents Competition (2023)  
First place, solo violin classical performance
- Golden State Youth Orchestra (GSYO)
  - Assistant concertmaster. Camilla Kolchinsky Orchestra (2023)
  - Concertmaster. Camerata & Chamber Players Orch. ('20–'22)